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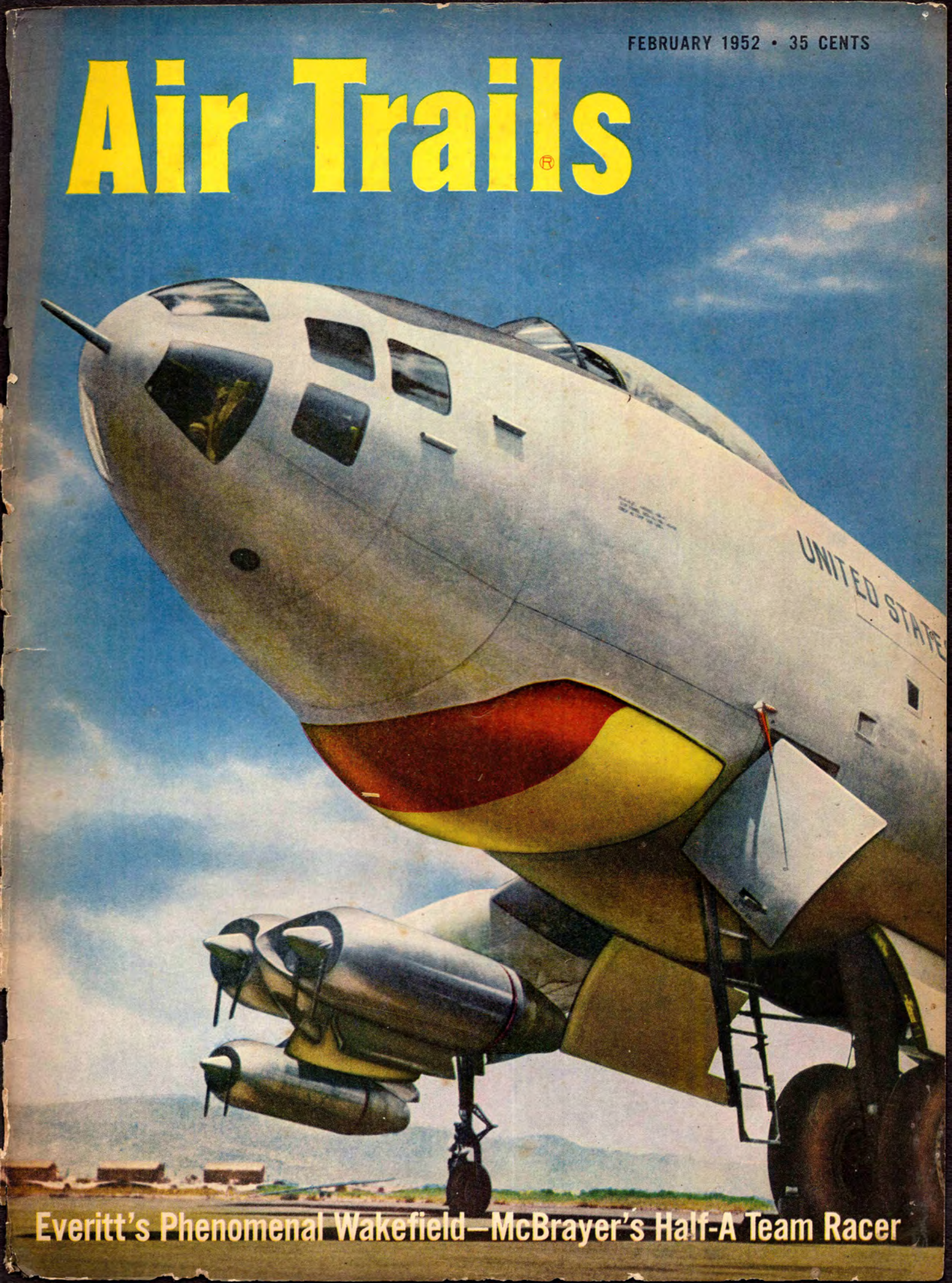

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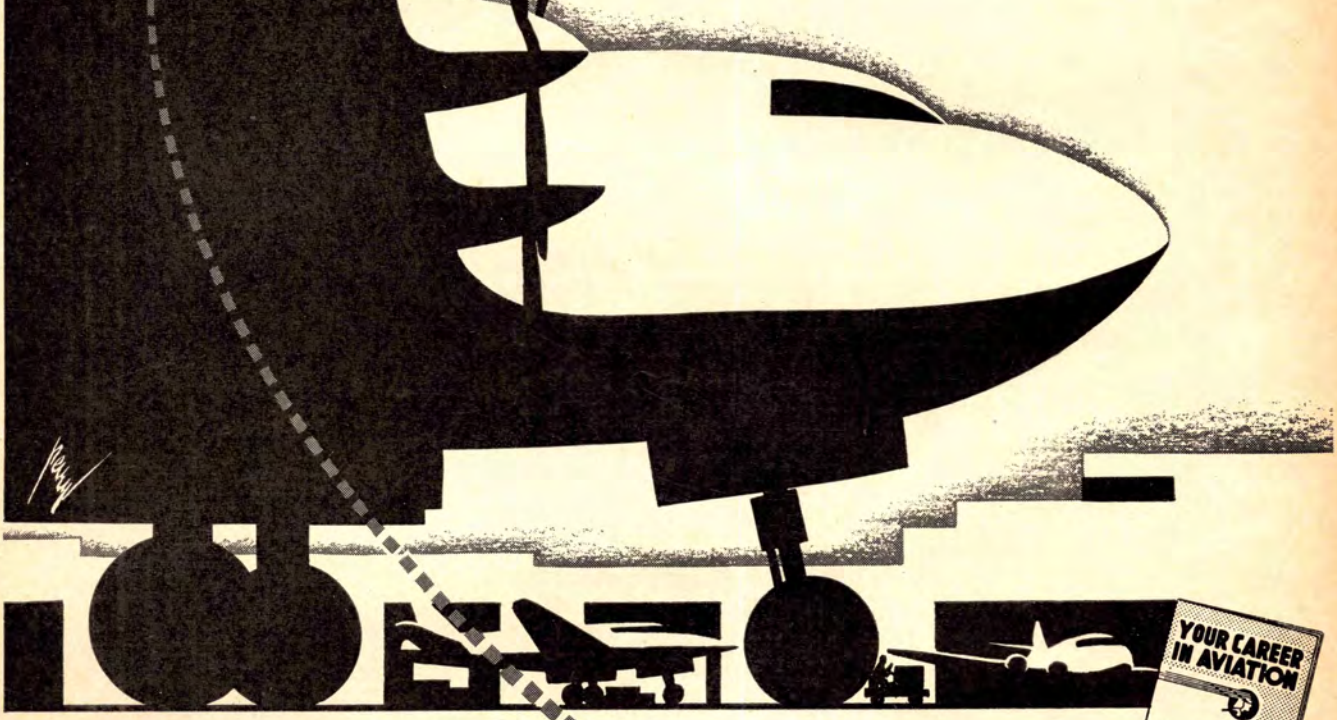

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February 1952 Vol. 37, No. 5

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FROM THE READER

All communications to the editorial offices should be addressed to Air Trails, 304 E. 45th St., New York 17, N. Y.

No Age Limit for Model Builders! . . . I know of no good reason why a man of my age should build model airplanes. Especially if he works 5½ days a week to support a family of six. But I will let some one else provide the explanation—if there is one. All I know is that I can hardly wait to get home at night so I can drag out the balsa and glue.

It started a little over a year ago. This is a very small town, and I did not even know of the existence of glow engines until I saw some while visiting a larger city. While in the shop I decided to buy a Cleveland P-38 scale kit. "Just for the kids," I explained to my wife. But I was really fascinated by the tiny engines which ran without batteries and coil. My next mistake was picking up a copy of AT to see what the modelers of 1950 were doing. That did it. The results you may observe from the attached photo of my son.

You probably recognize the ship as being Goldberg's Zipper "A." Power is .099 Cub. Incidentally, my last free flight gas job was a 7½ foot Brown Jr. powered whopper. You can imagine my surprise when I launched the Zipper under a full head of steam. Wow!!! It went up like a skyrocket, and I was only too happy to see it returning after leaving the field. Since then it has made many successful flights.

My current project is the Delanne Duo-Mono. I waited too long to get the full-size plans from Air Trails, so am having to scale up the ones from the magazine.

Edwin D. Gaskins, Jr., Alapaha, Ga.

Stamps . . . As Chairman of the Bay Ridge Stamp Society's committee of Stamps for the Wounded, I wish to thank you for your generous stamp contribution.

Our work to carry on the distribution of stamps is made much easier by organizations such as yours.

R. Spencer Familton, M.D., Brooklyn, N. Y.

Correction on SMAE . . . Just got my December copy of AT in which you used a picture of mine on page 59. It may have been my writing or an error on your printer's part, but Ken Brookes (*not* Brooks) is *not* the pres. of our Society of Model Aeronautical engineers. Caption should have read "Press Secretary."

Bill Dean, Thornton Heath, Surrey, England

Those Glider Kits . . . I would like to obtain information as to where I can get ground trainer and primary glider kits.

Robert E. Cannon, San Bernardino, Calif.

• Sorry, kits for ground trainer and primary gliders are not available as none are being manufactured any longer.

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Wants Proof . . . I keep reading these "review" articles on the '51 National Meet and everyone talks about how hot it was down there. Tell me truly, now, was it really hot at the Nats?

Pfc. John Jacobsen, Anchorage, Alaska

• Maybe this will convince you, John:

From Father to Son . . . Enclosed find a money order for a one-year subscription to Air Trails.

I would like to have the above subscription entered in my son's name . . .

I am sending this as a birthday gift to him as he has been an avid reader of "AT" for quite a few years. He is also a staunch modeler in both free flight and control line. He wrote me a short time ago and mentioned that he had sent a design to Airmen of Vision.

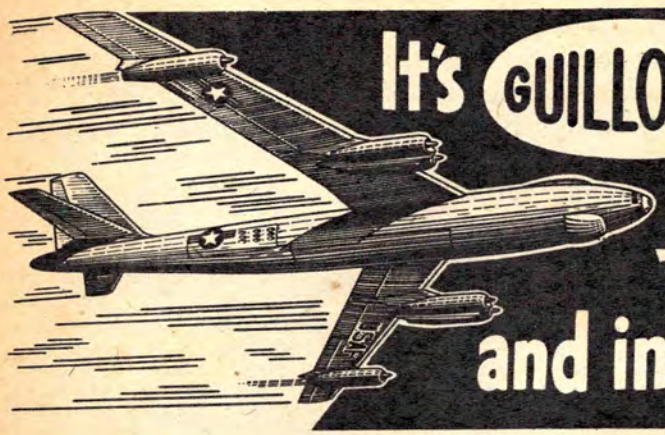
He is a licensed pilot with a number of hours' stick time which he earned the hard way, maintaining aircraft out here on the desert.

He was not eligible for pilot training in the Navy, due to difficulty with his eyes, but the Navy life on the carrier Essex has evidently thoroughly agreed with him and his eyes are now back to normal. At present he is crew chief on a Douglas dive bomber and has maintained his ship in a consistent "Outstanding" rating.

I too have enjoyed model aircraft, having built many original control liners with such features as all-metal construction, swept-back and straight versions and jet models.

I am particularly interested in jet models as I have been associated with jet engines since the Whittle engine as a Field Serv. Eng. Supv'r on aircraft gas turbines for General Electric Co., the last seven years being assigned to Muroc Base on various "X" projects.

John W. Burgess, Muroc, Calif.



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Powermist Glo	.95	—
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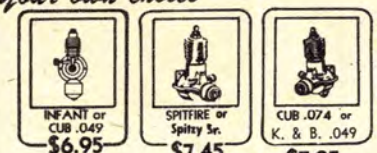

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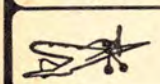

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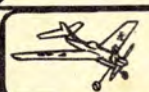

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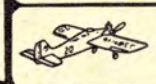

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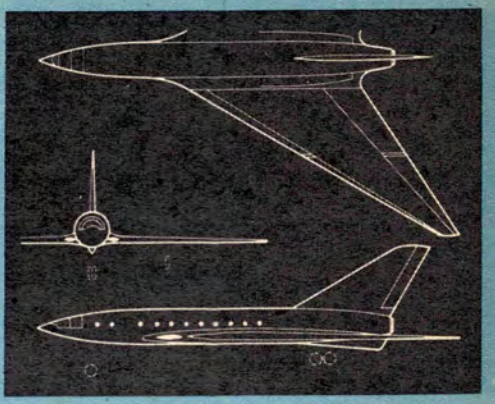
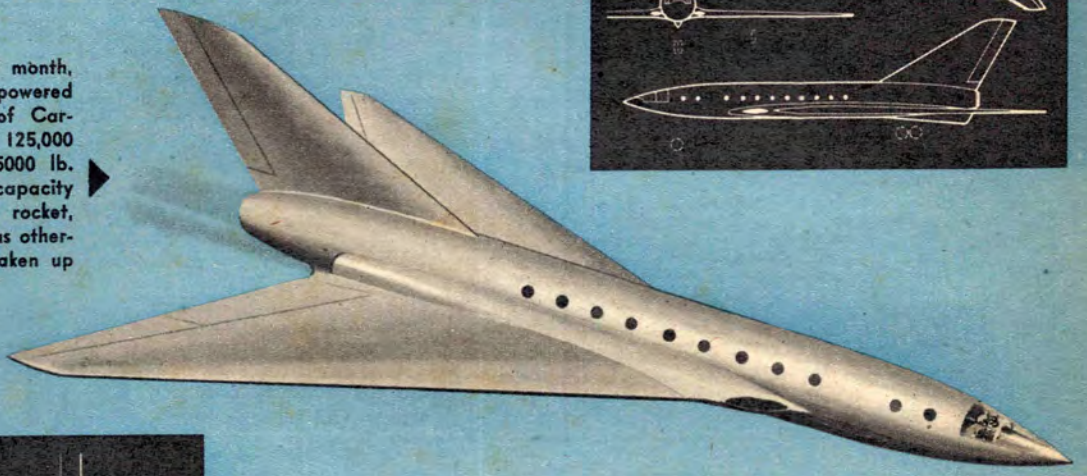
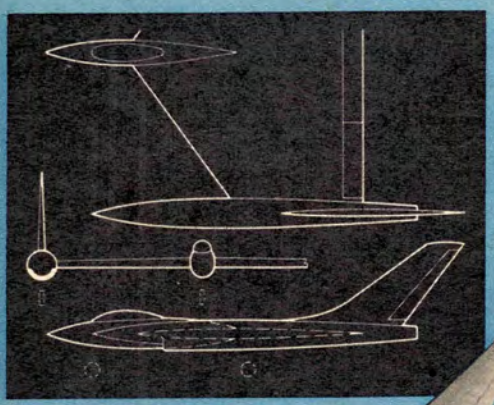
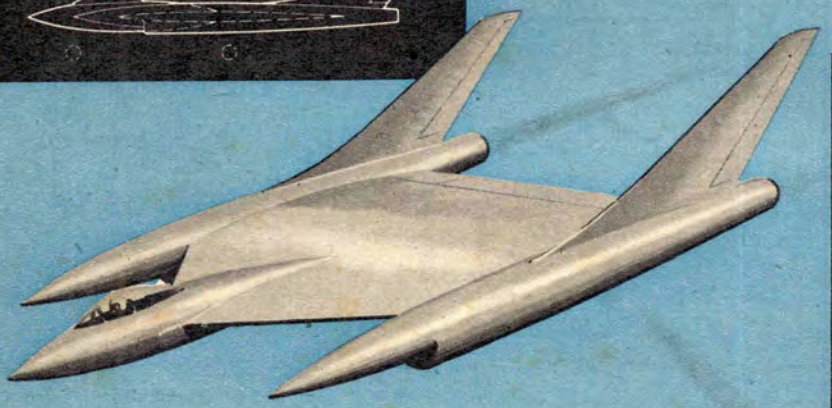


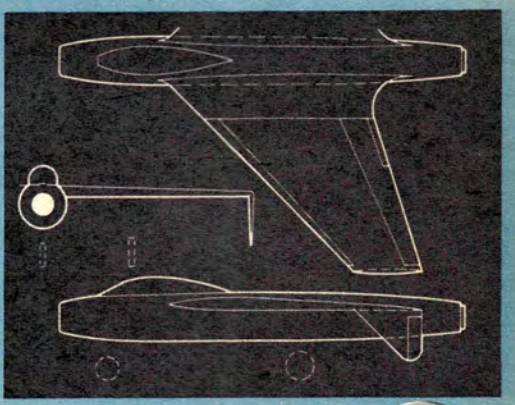
Number one design of the month, a delta-like rocket and jet powered transport by R. W. Flint of Carmichael, Calif. Powered by a 125,000 lb. thrust rocket and two 5000 lb. thrust turbo-jets. Passenger capacity for 24. With this type of rocket, atomic fuel will be required as otherwise all available space is taken up by propellant.



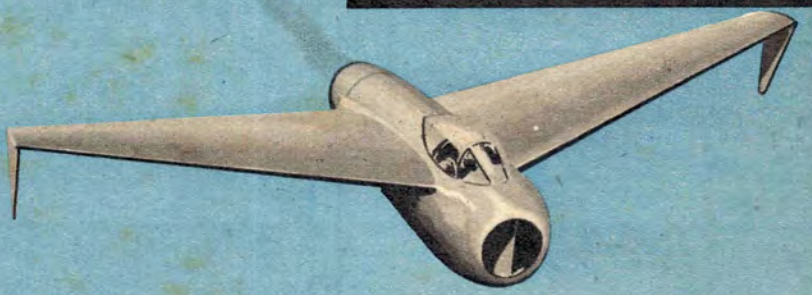


Twin-jet fighter by Maurice E. Libsor of New Haven, Conn. Has trapezoid type wing with long jet nacelles at each wing tip on which are mounted vertical fins and rudders. Aileron and elevator controls on wing's trailing edge. Design offers plenty of space for both armament and fuel load. Speed 680 mph.





Fingerwing. All-weather interceptor by 13-year-old Timothy Voorocek of Granger, Tex. Powered by 7200 lb. thrust jet engine. Span is 28 ft., length 27 ft. Estimated speed 750 mph. Range 1100 mi. Ceiling is 43,000 feet.



Air Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8½ x 11 inches for the entire three-views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information of power plant(s) estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and judges. The designs may be of any type: commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of $25. Payments of $5 will go to the runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E 45th St., New York 17, N. Y. Editors regret that because of large number of entries they cannot enter into correspondence on A. of V.

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R/C

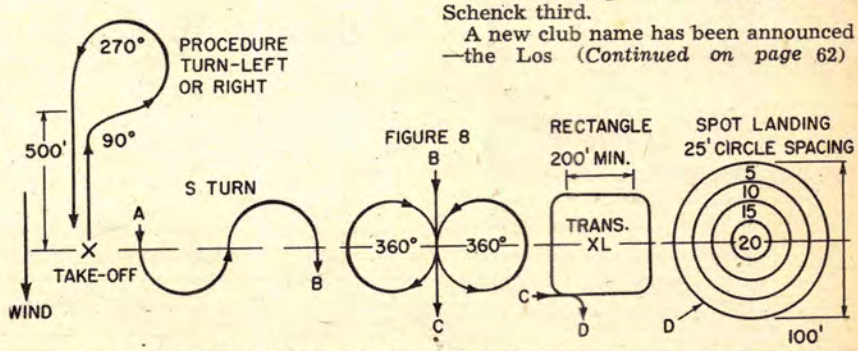
Around the modelplane radio-control circuit . . . comment and reports by a leading authority

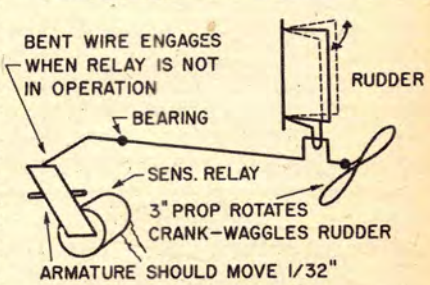
Contests and Clubs. The West Coasters' Flight Pattern contest scheme has had a fair trial and seems to have worked out very nicely, so guess it's time to spread the gospel. Briefly, the rules are as follows: 1. Flight Pattern must be completed first; then flyer can go after regular A.M.A. R/C points (simple turns and cross country flight omitted). 2. Flight Pattern sequence and *maximum* points are: (a) take-off (hand-launch, assisted, R.O.G.), 25; (b) straight flight 500 ft. to marker, 6; (c) procedure turn (right or left) over marker, 6; (d) straight flight back directly over transmitter, 6; (e) S-turn along line 90 deg. to wind, 10; (f) Figure 8 with axis crosswind, 10; (g) rectangular pattern around transmitter with each leg at least 200 ft., 12; (h) spot landing, 20; bonus points for landing within ½ min. after completing entire pattern, 15; landing within 1 min., 10; within 2 min., 5. Restrictions are included on length of flight time in the air on subsequent flights after the pattern has been completed, and contestants are allowed 5 min. to get airborne after another ship has landed.

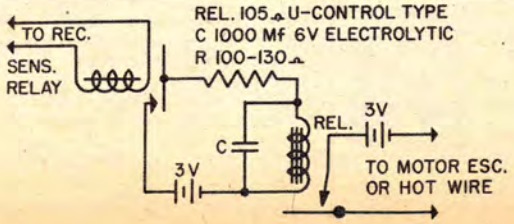
This system was originated in an effort to speed up contest flying, especially where there are many entries at a one-day contest. It has been found to require a bit over 4 min. to take off, fly the whole pattern and land. Thus there is time for a large number of flyers to compete. Any extra time can be flown for normal A.M.A. stunt points. The pattern can be flown at low altitude—in fact, the lower it is flown the more chance the contestant has of collecting the quick-landing bonus points. Judging is simplified as everyone does the same thing and the judges and flyers know beforehand just what comes next, at all times. Further details may be had from Howard Bonner, 1607 So. Bundy Drive, Los Angeles 25, Calif.

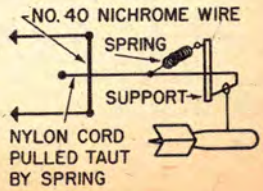
We learn belatedly that the Annual R/C Meet of the Pittsburgh Flying Circuits was won by Fred Collins, who got a trophy and a 27 mc. transmitter. Norm Tauberg was second, Jim Schenck third.

A new club name has been announced —the Los (*Continued on page* 62)









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Here's some late air-news intelligence for A/A members:

BRITISH ROCKET, larger than German V-2, made initial flight. . . . AFTERBURNERS boosting power added to Northrop F-89 Scorpions. . . . MULTIPLEX bomber new monicker for Douglas AD Skyraider; basic plane produced as "universal chassis" along with conversion kit; aboard-carrier aircraft easily converted to dozen different combat types according to requirements. . . . DIESEL ENGINE delivering 125 hp tried out in Taylorcraft at Pittsburgh; engine is air-cooled. . . . DRAG CHUTE used on Boeing B-47 to reduce landing runs only 8 feet larger than standard crew parachute, but much stronger. . . . AUSTRALIAN AIR FORCE ordered 48 Canberras and 72 F-86 Sabres.

HELICOPTER's contribution in Korea has cut ten years off the 'copters anticipated time of development and recognition. . . . THREE WORLD RECORDS established in U.S.A. confirmed by F.A.I. (Federation Aeronautique Internationale): speed over 100 km (62 miles) course, 639 mph. Col. Fred J. Ascani in F-86E Sabre; distance in single-place glider, 538 miles by Richard H. Johnson, in RJ-5 sailplane, Odessa, Texas, to Salina, Kansas; altitude, light seaplane, Harold Mistele, 20,175 ft. in Aeronca Sedan equipped with floats. . . . AMERICAN BUILT Sapphire turbo-jets to power B-57A Canberras under construction at Martin plant carry designation J-65-W-1; engines develop 7200 lbs. thrust.

ARGENTINE SENORITA Ampara Maneyro Segado set new record by completing 857 loops in Piper J3 Cub. . . . U.S. ARMY can now own and operate fixed and rotary wing aircraft of any weight; previously Army confined to use of liaison planes of not over 2500 lbs, while weight of helicopters could not exceed 4000 lbs. . . . RADIO RANGES and fan markers will soon "talk" their identification at a number of locations. . . . AVRO ORENDA, Canada's jet engine, is to be fitted with afterburner. . . . TWO NEW models of F-86 Sabre to go into production at North American, designations are F-86F and F-86H; both will have more powerful GE J-47 engines; "H" slightly larger than current Sabre to serve as fighter-bomber; "F," improved version of F-86E. . . . STRAP-ON helicopter worn on your back, powered by rocket motors, developed by Rotor-Craft Corp.

BOEING B-47 Stratojet delivered to AF's Strategic Air Command, averaged 575 mph on delivery flight from Wichita, Kan. to Tampa, Fla. . . . Twin-engine turbo-prop Convairs to be built by Consolidated Vultee for U.S. Air Force. . . . GRUMMAN airplanes will be built by General Motors at Arlington, Texas plant; during World War II, GM produced 13,500 Grumman fighters and bombers at Linden and West Trenton, N.J. . . . FAIRCHILD has 1000 lb. thrust jet engine; designation is J-44. . . . THREE DETACHMENTS of US. Army helicopters attached to Mobile Air Surgeon Hospital in Korea rescued 4500 wounded in 10 months. Each detachment has four Bell H-13D helicopters, pilots and mechanics. One pilot, Lt. Joseph Bowler, devised method of blood-plasma transfusion while 'copter is in flight.

CESSNA 308, larger version of popular personal plane, capable of carrying pilot, passenger and two litter cases, powered by 8-cylinder Lycoming air-cooled engine of 375 hp, undergoing tests; plane will be for military use.

CANADIAN PACIFIC LINES ordered three Douglas DC-6Bs equipped with a buffet, cloakroom, lounge, small cocktail bar. . . . BOTTLED GAS, LPG (Liquid Petroleum Gas) is used as fuel by Landrum Hughes of Oklahoma City, Okla. in Aeronca Sedan. Engine has run for 200 hours without oil change (compared to 25 hours for gasoline-burning engine).

AGE LIMITS: There are no minimum or maximum age limitations on Air Adventurers Club membership

MAIL TO: Air Adventurers, c/o Air Trails, 304 East 45th Street, New York 17, N. Y. Print all information required on the application; sign where indicated.

I hereby apply for membership in the Air Adventurers Club and promise to do everything in my power to uphold the principles of the organization and work for the advancement of American aviation. I enclose 25¢ in well wrapped coins for my credentials ☐; 50¢ for credentials *and pin* ☐—(indicate which).

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CIVIL AIR PATROL NEWS

■ The manpower need of the air services and industries has placed a new value on the Civil Air Patrol Cadet Program—or rather, has drawn attention to the value that was already there.

It is hard to believe there is a shortage of aviation skill in this country, after the millions trained in the air forces in the last war and the hundreds of thousands since in GI courses.

Yet the airlines are hiring mechanics wherever they can find them and must go hunting even for copilot candidates. The aircraft plants will need a million more workers within two years. The air forces, in addition to their expected enlargement, will have to have a steady stream of competent replacements for men released from duty.

CAP Cadet training, of course, will not produce pilots and mechanics, but it will start many on the way. It is a means toward developing interest all across the country so that aviation can recruit not only from the large centers but from small communities.

Those past high school age who want a career in aviation can assure themselves almost certain employment at good pay by entering a reputable aviation school. Those still in high school, from ages 14½ through 17, can get a preview of the field from CAP.

High School Program

Increasing stress is being placed on the CAP-high-school coordinated program. Schools that undertake it are giving a year course, with one unit of official credit, in the general elements of aviation, including theory of flight and the rudiments of navigation and meteorology, together with history and a broad view of modern air activities.

Thus far, 228 high schools among the 52 State and Territorial Wings of CAP are giving the CAP-coordinated courses. Some 7,000 students are enrolled, including some who are not members of CAP.

In future expansion, the training of teachers will be stressed. So many young people already have good background in aviation through aeromodeling, reading, and talking with adult airmen, that a teacher must be more than one jump ahead of the day's lesson to hold interest and answer the many questions.

A way to prepare is to hold "summer workshops" where teachers can learn. A precedent may have been set last year in Puerto Rico where Dr. Mervin K. Strickler, educationist from CAP Headquarters at Bolling Air Force Base, Washington, D. C., conducted the first CAP workshop project. High school teachers were given lectures by CAA, airline, and other aviation people, and witnessed the whole operation of an airport.

From this successful experiment, a syllabus is being drawn for use, after it is checked with educational advisers, wherever the schools want to meet the modern world and advance into the new air age.

Scholarship Program

A new development, about which CAP has begun to talk after long planning, is the creation of a CAP Foundation for scholarships. A fund of $10 million or more will be sought.

Early in World War II, the scholarship idea was developed in many areas to purchase flying lessons for outstanding Cadets, both boys and girls. Some cities raised thousands of dollars each.

The national plan will carry such opportunities into all areas, to furnish incentives. As it is, CAP receives no federal appropriations. Government aid is only in the form of advisory personnel (the National Headquarters plus an Air Force Liaison Officer with a sergeant and secretary in each CAP Wing area) with equipment and training aids.

For private financing of purposes, such as the international Cadet exchange, where the individuals concerned could not afford to foot the bill, the dues of $3 per year for each Senior member have been deposited by the CAP Corporation, formed on a non-profit basis. But the annual exchange and drill competitions, together with other necessary work, use up most of this income.

Radio Net

In addition to aviation activities, CAP offers opportunities for practical training in the fast-growing field of electronics where skill likewise is in great demand.

The CAP radio network is so big that if all the other communications in the country—phone, telegraph, radio, and mail—were stopped, a heavy volume of messages still could be carried in every region.

At latest count, the net comprised no less than 8,000 stations using one or another of the four CAP frequencies. Close to 1,300 of these are fixed stations and the rest are mobile. Of the latter, some 3,000 are walkie-talkies and the rest auto or aircraft radios.

Girl Scout Program

A cooperative program with the Girl Scouts has been agreed to by Civil Air Patrol. Senior Girl Scouts of 14 through 17 may enroll singly or in groups for CAP training, in line with "Wing Scout" aims.

CAP now has 5,000 women Senior members and 8,400 girl Cadets. This work is supervised by Col. Frances Nolde of Reading, Pa. Importance is attached to air indoctrination of women to meet the growing needs of the Women's Air Force.

Join the Civil Air Patrol—the civilian auxiliary of the U. S. Air Force. Cadets are 14½ to 17; Senior members 18 and over.

C. A. P. NEWS c/o Air Trails
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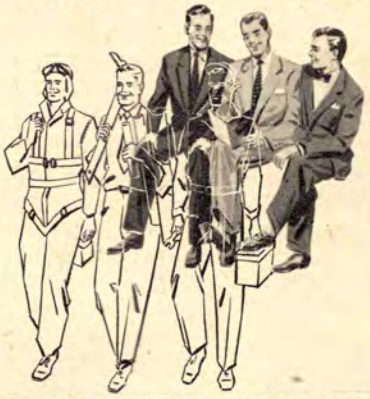
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Jim Walker **A-J AIRCRAFT CO.**

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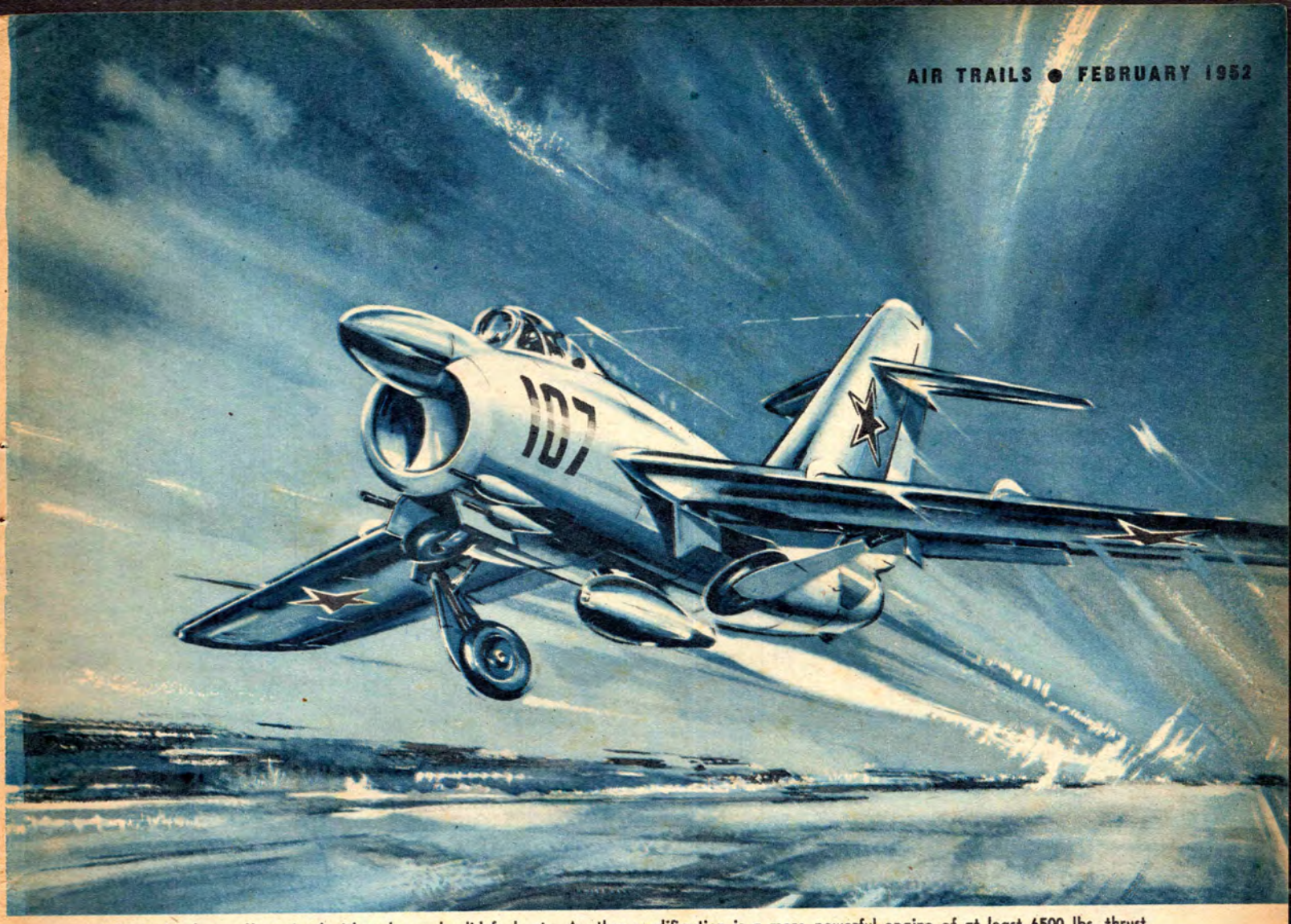
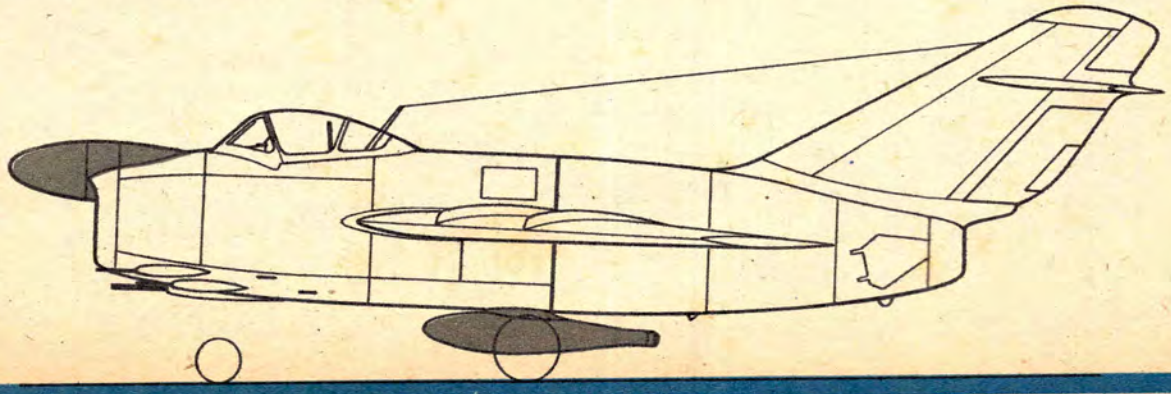


MiG-15 bis (second) equiped with radar and solid fuel rato. Another modification is a more powerful engine of at least 6500 lbs. thrust.

REDS' F-86

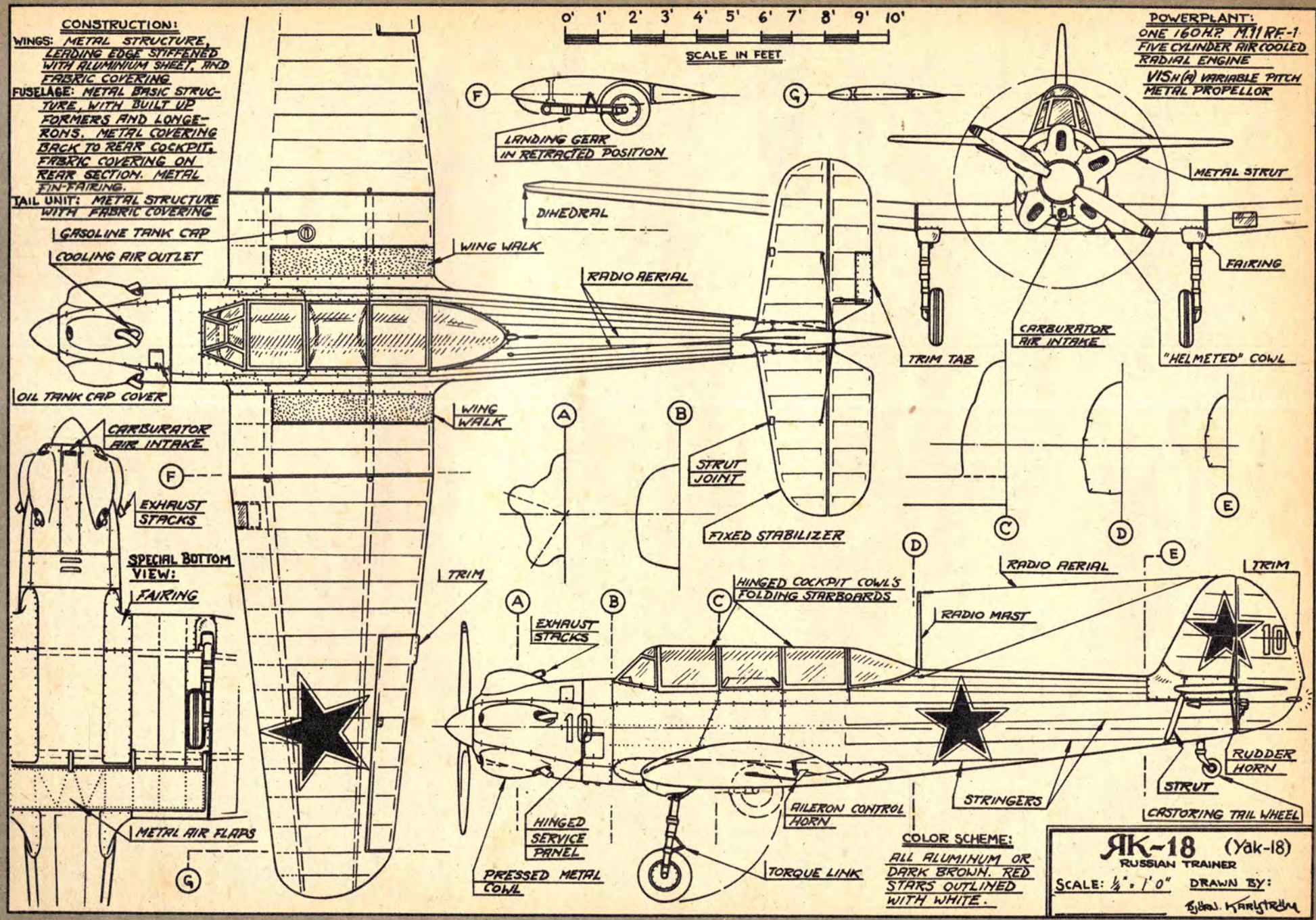
All-weather fighter addition to Russian AF bears remarkable resemblance to our F-86D

■ The first known major modification of the Russian MiG-15 was reported to have made its initial appearance, outside of USSR, over the Balkans. Now, these improved MiGs have been sighted singly and in pairs over East Germany and Korea. Majority of improvements are said to be external. Most interesting is the radar snout, believed to house a four-foot dish antenna undoubtedly capable of both search and aiming functions. This is significant development which indicates increased Red interest in all-weather fighters and a switch to radar sighting to overcome gunnery deficiency so evident over "MiG Alley." A bit crude compared with radar nose of our F-86D Sabre, but it suggests that Russians are catching up fast.



Shaded areas show additions to the standard MiG-15 fuselage, radar and rato. Radome adds two feet to fuselage, making it 35'4" long.

YAK-18 RED TRAINER



Soviet "Sikorsky"

This is No. 3 in the known helicopter development in Russia, and undoubtedly the most successful one. A very orthodox design. Designation of the craft is not known.

■ Along with the two new fighters—one of them the "Super MiG"-19—which made their debut at the last Aviation Day display at Tushino Airdrome near Moscow, there appeared a new helicopter that follows more closely the configuration and thinking associated with Western whirligigs.

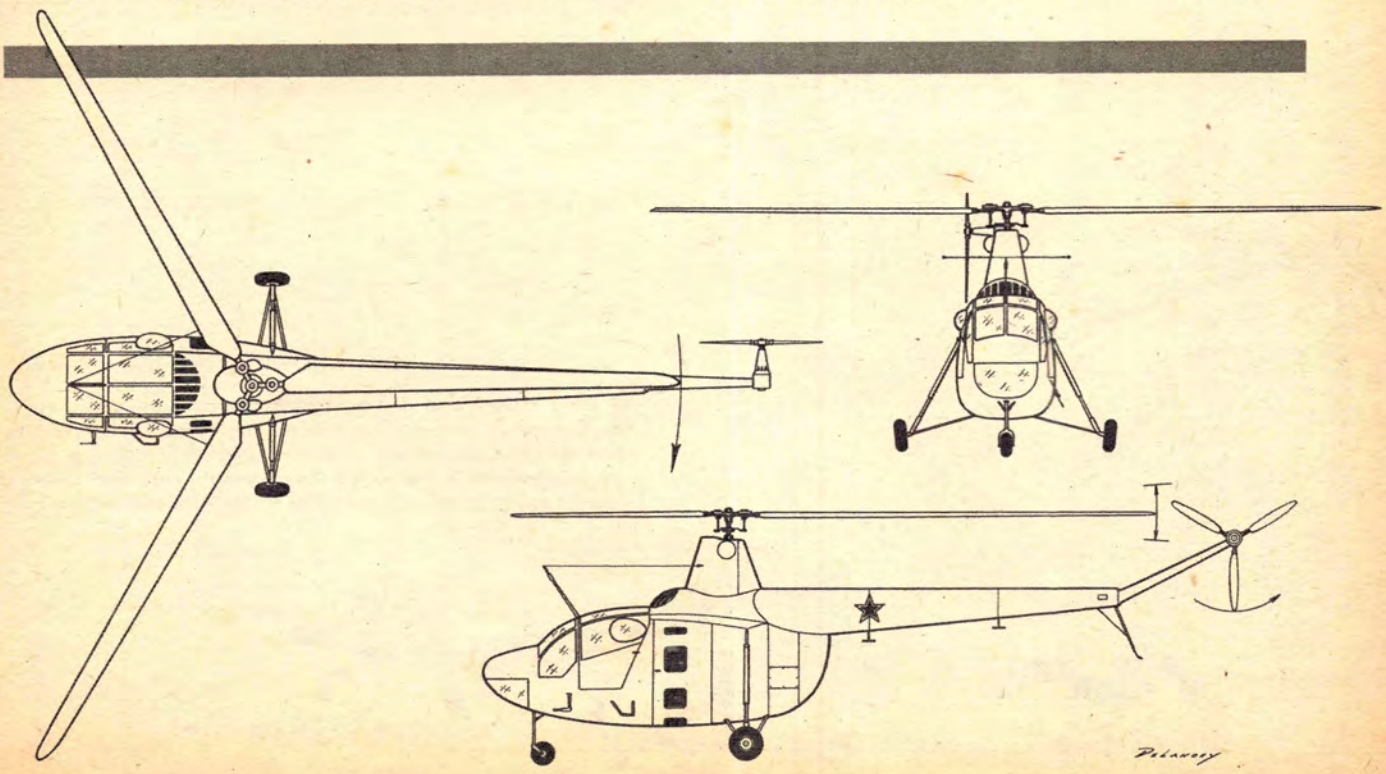
Designed by Mikhail Mil, this helicopter is a single-engined, 3-4-place machine with conventional cyclic pitch control arrangements and generally straightforward design with some resemblance to Sikorsky and British Bristol craft.

The Red Air Force has, heretofore, progressed slowly with whirling-wing aircraft despite a long-time interest. The outstanding effort, still in the experimental stages according to our sources, was the Omega III designed by Ivan P. Bratukin. This twin-engined 24-passenger 'copter is expected to go into production soon. The second Russian helicopter designer is N. I. Kamov, who produced in 1948 a small co-axial rotor type.

Mikhail Mil is a new designer, and his simple approach along conventional lines may well spell larger and more rapid production of helicopters in the USSR. Certainly, the Reds cannot be expected to have overlooked the manner in which our helicopters have proved their usefulness in Korea to date in both rescue and assault (vertical envelopment) tactics. And it seems reasonable that Soviet efforts in this direction may take on a new urgency.

Specifications of this new 'copter are as follows:

Fuselage—Full-vision cockpit, side-by-side seating. Passenger seats aft, accommodating one or two persons in addition to crew. Overall length with main and tail rotors at minimum position, 44 feet 6 inches. Height, 13 feet 6 inches. *Rotors*—Three blades, wooden construction with metal spar and plywood covering. Aerodynamic tabs fitted at approximately half span of each blade. Blades are fully articulating in both flapping and dragging planes, with adjustable friction dampers on drag hinges. Rotors can be folded to rear for parking or shipboard stowage. Rotation is in counter-clockwise direction. Main rotors, 48 feet 6 inches. Tail rotor, 8 feet 3 inches. *Landing gear*—Tricycle type with castering nosewheel, and tailskid aft to guard tail rotor. *Powerplant*—Specially modified ASH-21, or new type engine of 300-450 hp. *Weights:* Empty, approximately 3,000 lbs.; load, approximately 1,000 lbs.; gross, approximately, 4,000 lbs. *Performance:* Maximum speed at sea level, 100-110 mph. Maximum range, 400-450 miles.

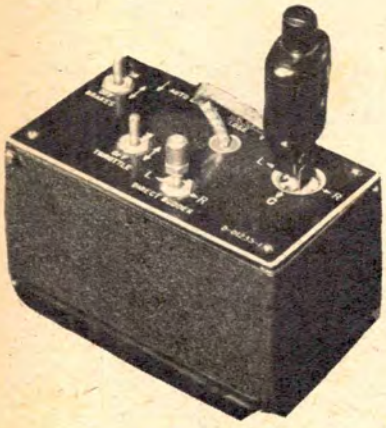


PLANES without PILOTS

They've been clay pigeons in gunnery practice, bombed Jap and German targets, and brought back data from the heart of Bikini's cloud. Uncle Sam's radio-controlled planes have missions in mind never remotely guessed at by Jules Verne.

An F6F-3 Hellcat is landed by ground control officer during operation Crossroads, where it flew through atomic cloud. Plane is taken off in the same manner and as soon as airborne a mother-plane assumes control over it. Top picture shows three Air Force B-17's flown in close formation by radio control. These ships were also in Bikini tests.

■ They call them "drones" or pilotless aircraft and they range in size from an overgrown model-plane to a multi-engine bomber. Their purpose is as varied as their size. Some serve as clay pigeons for gunnery practice; others, loaded with special instruments, have probed the heart of an atomic explosion and brought back valuable information otherwise inaccessible to human beings. These "planes without pilots" are remotely controlled by radio, from the ground, and mother-planes called "Queens." Since 1936, when the control of full-size airplanes by radio was first successful, they have contributed a major share in the development of guidance systems on which future push-button warfare depends. (Photos from Naval Aviation News.)



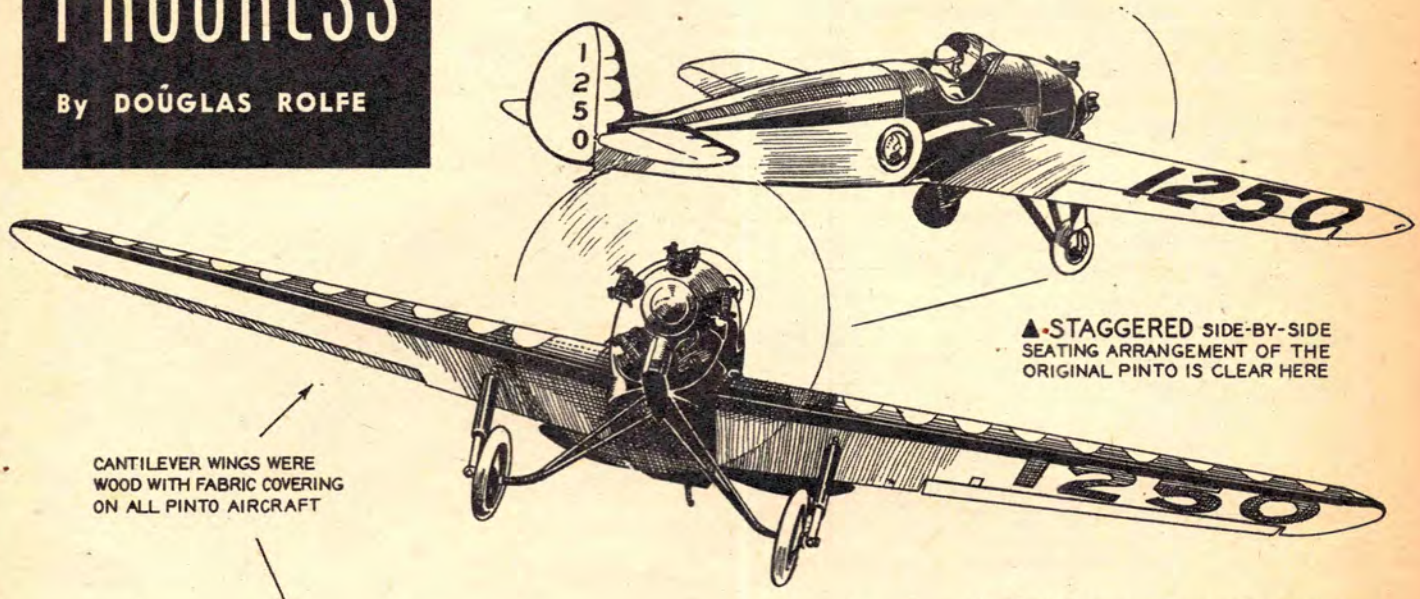
Above: An F6F drone guided by "Queen" plane, with a spare one on hand. Drones are usually painted red. Left: Drone control unit as used in F7F Tigercat mother-plane. Below: This TDR drone was the first pilotless bomber used in Pacific against Japs. Carried 2000-lb bombs.

OQ-19A Air Force target drone. This type is used for anti-aircraft target practice, is launched from a catapult and put through various maneuvers by radio control. This little plane is capable of a speed of 220 mph; a difficult target to hit. Parachute in fuselage, opened by radio signal, lands ship.

AIR PROGRESS

By DOUGLAS ROLFE

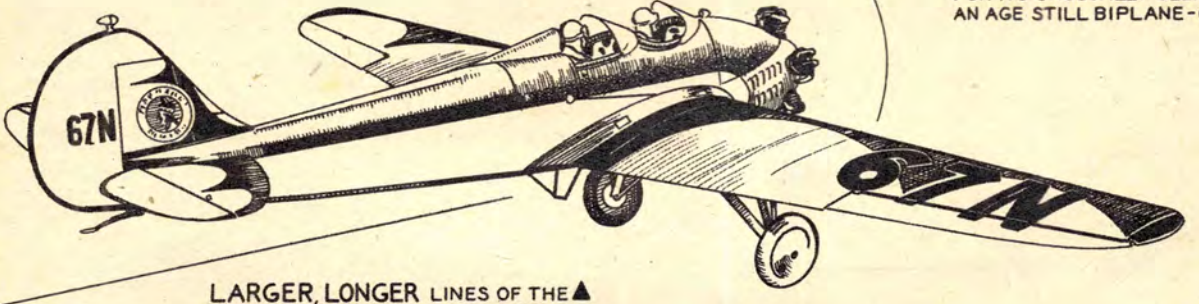
The Mohawk "Pinto"



▲ STAGGERED SIDE-BY-SIDE SEATING ARRANGEMENT OF THE ORIGINAL PINTO IS CLEAR HERE

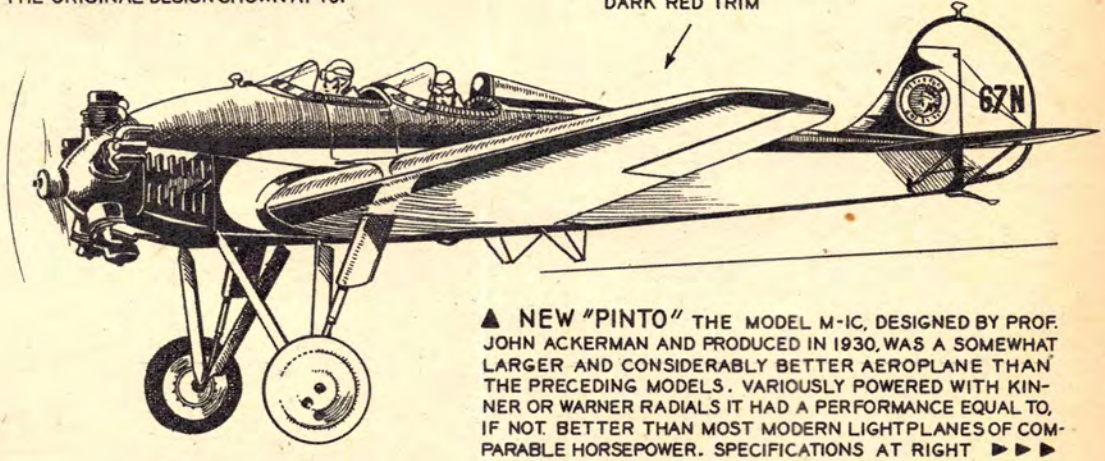
CANTILEVER WINGS WERE WOOD WITH FABRIC COVERING ON ALL PINTO AIRCRAFT

▲ FRONTAL APPEARANCE OF THE ORIGINAL PINTO WAS REMARKABLE FOR ITS UNUSUALLY CLEAN LINES IN AN AGE STILL BIPLANE-CONSCIOUS



LARGER, LONGER LINES OF THE ▲ RE-DESIGNED PINTO ARE APPARENT IN THIS VIEW WHICH SHOWS THE AEROPLANE IN A SIMILAR POSITION TO THAT OF THE ORIGINAL DESIGN SHOWN AT TOP

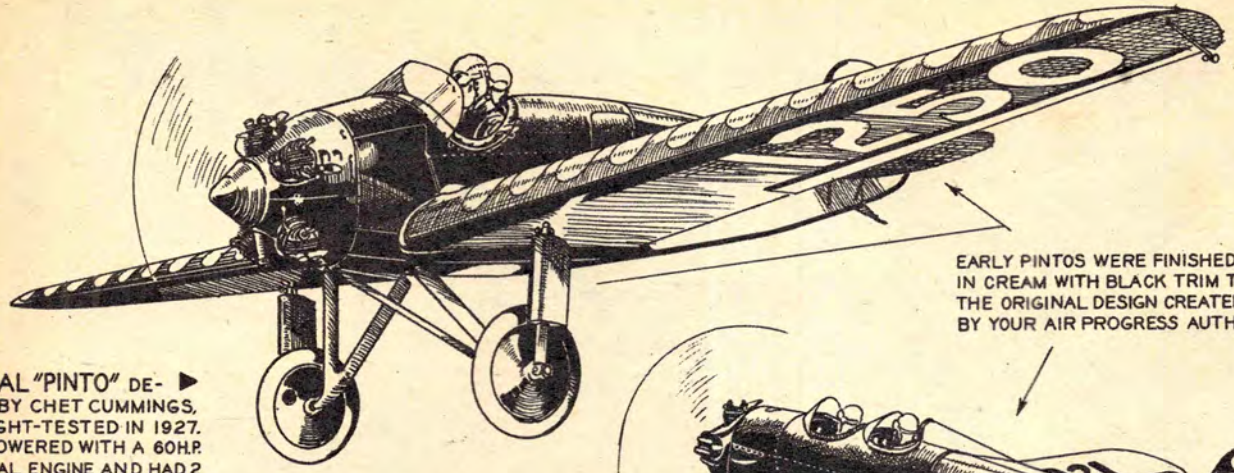
COLOR SCHEME OF LATER PINTOS WAS CREAM WITH DARK RED TRIM



▲ NEW "PINTO" THE MODEL M-IC, DESIGNED BY PROF. JOHN ACKERMAN AND PRODUCED IN 1930, WAS A SOMEWHAT LARGER AND CONSIDERABLY BETTER AEROPLANE THAN THE PRECEDING MODELS. VARIOUSLY POWERED WITH KINNER OR WARNER RADIALS IT HAD A PERFORMANCE EQUAL TO, IF NOT BETTER THAN MOST MODERN LIGHTPLANES OF COMPARABLE HORSEPOWER. SPECIFICATIONS AT RIGHT ▶▶▶

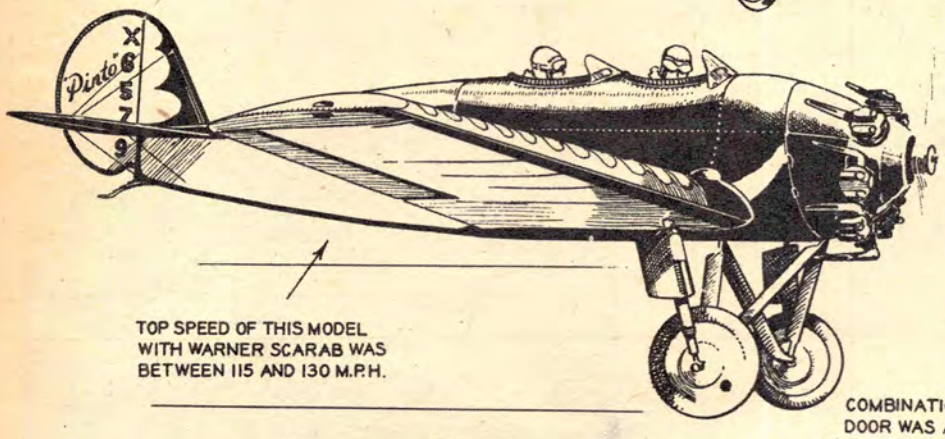
Despite the brief period during which these interesting planes were produced, they have a definite place in Air Progress since they were probably the *first* to approach the personal plane market from a modern angle (in the U.S.A., that is). It is difficult today to realize the prejudice which existed a quarter of a century ago toward low-wing, and especially cantilever low-wing design, but it did exist and many pilots refused to regard such ships as stable or even safe. Of course, the same prejudice had appeared much earlier against the high-wing or parasol monoplane. It was naturally exploded by actual performance.

The Mohawk "Pinto" series had its beginning in late 1927 when four young men formed the original company and proceeded to build the prototype model by hand in a rented



EARLY PINTOS WERE FINISHED IN CREAM WITH BLACK TRIM TO THE ORIGINAL DESIGN CREATED BY YOUR AIR PROGRESS AUTHOR

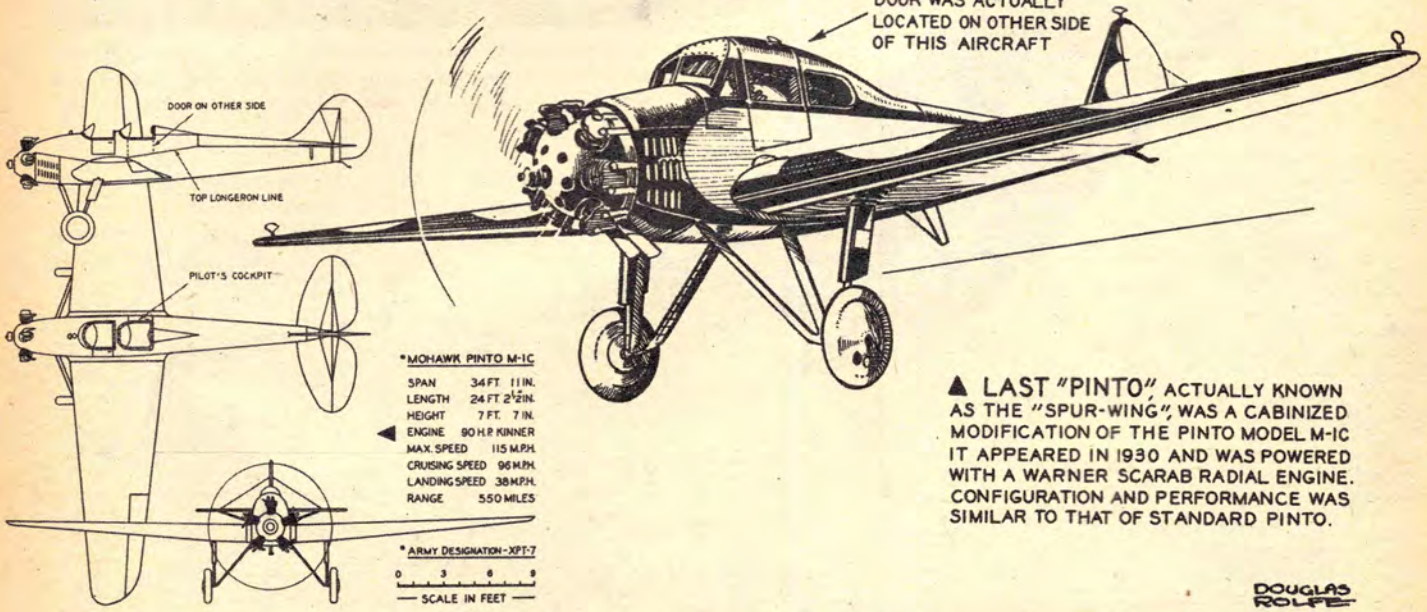
ORIGINAL "PINTO" DESIGNED BY CHET CUMMINGS, WAS FLIGHT-TESTED IN 1927. IT WAS POWERED WITH A 60H.P. RADIAL ENGINE AND HAD 2 STAGGERED SIDE-BY-SIDE COMFORTABLE SEATS. FUSELAGE AND CONTROL SURFACES WERE OF STEEL TUBE CONSTRUCTION. NO RELIABLE PERFORMANCE FIGURES EXIST FOR THIS SHIP.



TOP SPEED OF THIS MODEL WITH WARNER SCARAB WAS BETWEEN 115 AND 130 M.P.H.

TWO STAGES IN THE DEVELOPMENT OF THE PINTO ARE DEPICTED HERE. AT LEFT WE SEE THE FIRST MODIFICATION OF THE ORIGINAL PINTO WITH TANDEM SEATS AND 110 H.P. WARNER SCARAB ENGINE. THE PRODUCTION MODEL (ABOVE) HAD SAME AIR FRAME, MINOR DESIGN REFINEMENTS, AND WAS POWERED WITH A 70 H.P. VELIE ENGINE WHICH GAVE IT A MAXIMUM SPEED OF 105 M.P.H. PRICE WAS $2,775.

COMBINATION HATCH-DOOR WAS ACTUALLY LOCATED ON OTHER SIDE OF THIS AIRCRAFT



*MOHAWK PINTO M-1C

SPAN	34 FT. 11 IN.
LENGTH	24 FT. 2½ IN.
HEIGHT	7 FT. 7 IN.
ENGINE	90 H.P. KINNER
MAX. SPEED	115 M.P.H.
CRUISING SPEED	96 M.P.H.
LANDING SPEED	38 M.P.H.
RANGE	550 MILES

*ARMY DESIGNATION - XPT-7

0 3 6 9
— SCALE IN FEET —

LAST "PINTO" ACTUALLY KNOWN AS THE "SPUR-WING", WAS A CABINIZED MODIFICATION OF THE PINTO MODEL M-1C IT APPEARED IN 1930 AND WAS POWERED WITH A WARNER SCARAB RADIAL ENGINE. CONFIGURATION AND PERFORMANCE WAS SIMILAR TO THAT OF STANDARD PINTO.

DOUGLAS ROLFE

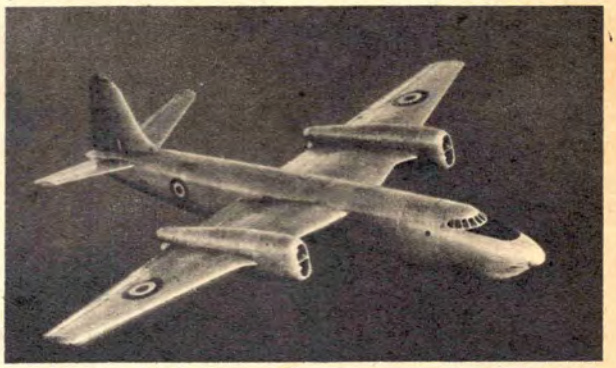
warehouse. This original Pinto was not an entire success. It was, however, flown by many noted pilots, including Col. Charles Lindbergh.

The good looks and radical nature of the design soon attracted capital in the then booming Twenties and a new Pinto was developed. It finally obtained its Approved Type Certificate, though only after a series of near disasters in which two of the several test pilots (one no less than the late great Charles "Speed" Holman) were obliged to bail out when it failed to recover from a voluntary spin.

The last Pinto was a very different plane although it retained the basic features of the original design. It was also a very good plane and with it the Mohawk Company might have prospered except for the Depression.

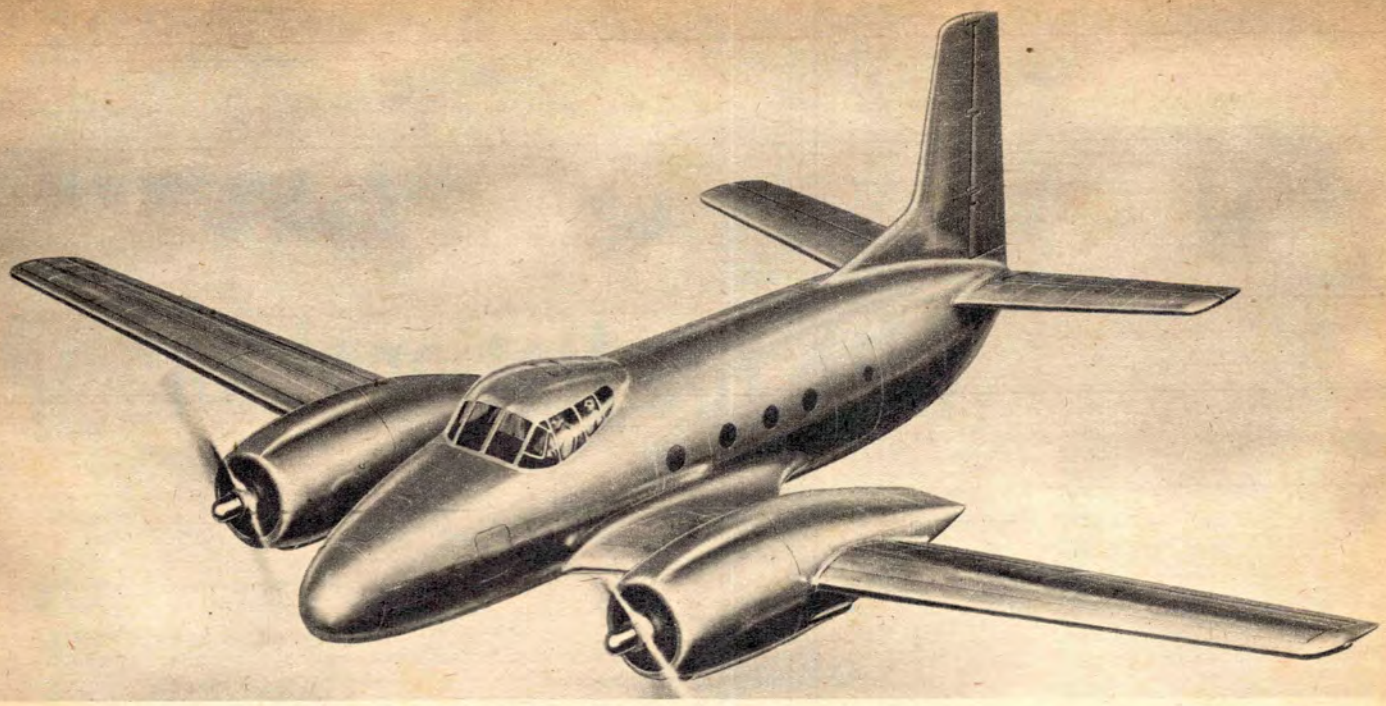
F2H-2P Banshee. First carrier-based jet photographic airplane. Extended nose houses six types of cameras. Ship is same as standard Navy F2H-2 with exception of elongated nose.

DEVELOPMENT HIGHLIGHTS

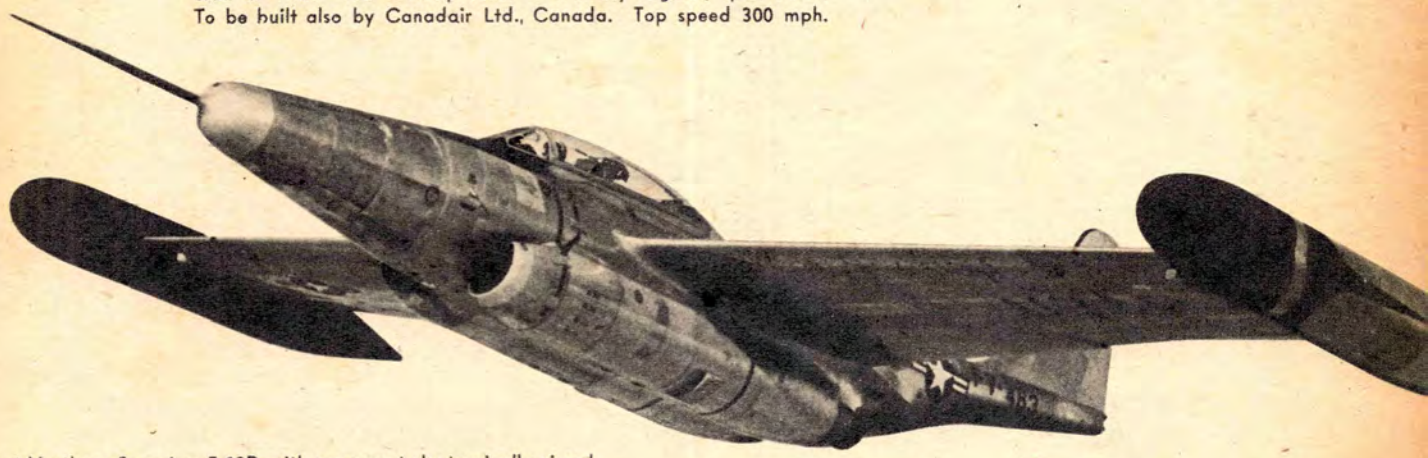


Second of Great Britain's multi-engine jet bombers, the Short SA-4. First appearance in public was at recent Farnborough show. Four RR Avons, mounted one above other in two nacelles.

Swedish Saab J-29 is now coming into service with Swedish AF fighter squadron. Plane is powered by a D.H. Ghost engine of 5000 lb. thrust, built under license. Top speed 645 mph.



Beechcraft T-36, latest USAF advanced trainer-transport. Carries crew of four. Two 2300 hp Pratt & Whitney engines, span 70 ft. To be built also by Canadair Ltd., Canada. Top speed 300 mph.



Latest Northrop Scorpion, F-89D, with armament electronically aimed, triggered. Two Allison J-35s with afterburners. Gross weight 40,000 lbs. Rocket armament carried in streamlined containers on wingtips.

Douglas AD-5 Skyraider. Is delivered with conversion kit, which in short time can transform it into either passenger transport, ambulance plane, attack bomber, or anti-submarine hunter-killer.

"AT" Interviews Paul Simon,
Top Man at the National Meet

We Chat-
with the National Champ

Paul Simon, National Champ, holds famous Exchange Club top-place trophy.

Crowned America's Champion Aeromodeler by virtue of his outstanding performance at the last National Model Airplane Meet held in Dallas under the sponsorship of The National Exchange Club, 18-year-old Paul Simon of the Detroit Balsa Bugs Club was awarded an all-expense-paid trip to Miami to attend the annual Exchange Convention. On his way back from Florida Paul stopped off in New York to make a guest appearance on the Tex & Jinx TV Show and granted "AT" this exclusive interview. Secretary Harter of the National Exchange Club has announced that this trip for the National Champ to each year's Exchange Convention is expected to be an annual affair.

Air Trails: "How long have you been active in model aviation, Paul? How did you get started?"

Paul Simon: "I've been really active for about five years. A modeler named Harold LeClaire lived across the street from me. He was a contest flyer and took me to meets and to his model club."

A.T.: "Did you start out with simple ships, or dig right in with a gassie?"

P.S.: "I started with a 10c rubber stick kit, which I think was called 'Phantom Flash'. We neighborhood kids would build and fly these awhile, then Harold would come out and show us how to double our flight duration. Then I went into paper-covered indoor models because there was a local prize called the Cooper Trophy which we all battled for."

A.T.: "Just what phase of model flying—that is, indoor or outdoor, glider, rubber, or gas—is your favorite?

P.S.: "Guess I prefer indoor, but I really like all sorts of free flight."

A.T.: "Do you build in categories other than those in which you placed at the Nats in Dallas?"

P.S.: "I've flown R.O.W. and Class A PAA-Load, but have never gone larger than Class A in gas." (*Ed. Note: Paul took 1st and 2nd respectively in these events at Dallas in 1950.*)

A.T.: "Any other members of your family who are modelers—somebody waiting to use the workbench?"

P.S.: "No, but fortunately my folks are tolerant—they'd rather have me at home building models than out wandering around."

A.T.: "Do you design any of your own ships?"

P.S.: "Practically all of them. At the Nats this year the Floater was my only kit ship."

A.T.: "Have you built from magazine plans?"

P.S.: "I've built quite a few ships from magazine plans, but I always seem to change them some way or other."

A.T.: "How much of your leisure time do you spend building and flying?"

P.S.: "Just about all of it, I guess. Since I graduated from school I've had a job, but have been away

Contest line-up—
N. Y. Mirror Meet

from that for the Nationals, and now for this trip."

A.T.: "Do you expect to try any new events in the near future?"

P.S.: "I hope to try B and C gas. I've done very little Scale model work, but will get into that, too, either in Rubber or Half-A; haven't decided yet on any particular ship."

A.T.: "We notice that all your Nats wins were in various free flight events. Have you ever tried C/L.?"

P.S.: "Yes, but only sport flying. All the free flight takes so much time I just can't get going in C/L. That combat flying looks like a lot of fun, though, and I'll probably be in our coming Club contest for this event."

A.T.: "Have you been high placer at any other contest besides the Nationals?"

P.S.: "I may have been, but can't recall for sure; I've never before received any trophies for high point scoring."

A.T.: "Do you expect to go after the Championship again at the next Nats?"

P.S.: "Sure do, if I can get to the Meet. I was in the same number of events at the '50 Nationals, but didn't come near being Champ; my points helped our club team win then, though."

A.T.: "Other than the Nats win, what has been your biggest thrill in modeling?"

P.S. (*After deep thought*): "I guess it was the places I got at the Plymouth Internationals in 1950. I was only two points below my buddy, Ronald Plotsky, who was Senior Champion." (*Ed. Note: Paul was 1st in Outdoor Cabin, 3rd in Indoor Cabin, 5th in Half-A gas.*)

A.T.: "Do you have good facilities for indoor flying in Detroit?"

P.S.: "Not any more. Several years ago we had good facilities and flew indoors every two weeks or so. We only fly indoors at meets now, and even at these we usually have to build small ships of 100 sq. in. or so due to the small space. We have indoor club meets, too, but our space is even more restricted and the ships have to be kept to 50-60 sq. in. The indoor planes I had at Dallas were all new and untested."

A.T.: "How about outdoor flying spots around Detroit?"

P.S.: "Good spots are very scarce. The field where most of us fly is of moderate size and bounded by main highways. We always use short motor runs and fuses, because beyond the field it's solid trees and houses."

A.T.: "Is there any modeling activity carried on in the schools at Detroit?"

P.S.: "Yes, Plymouth sponsors paid instructors who visit practically every school in the city. They also furnish kits and supplies at low prices. This activity is held after school hours, and the instructors build the same plane the kids do to show them how it's done. Plymouth puts up prizes for contests in each school, then section eliminations, and then a final contest. These classes are held in the grade schools only and get a lot of new modelers started. Our club has gotten quite a few new members from this program, which I think is still headed by Merrill Hamburg."

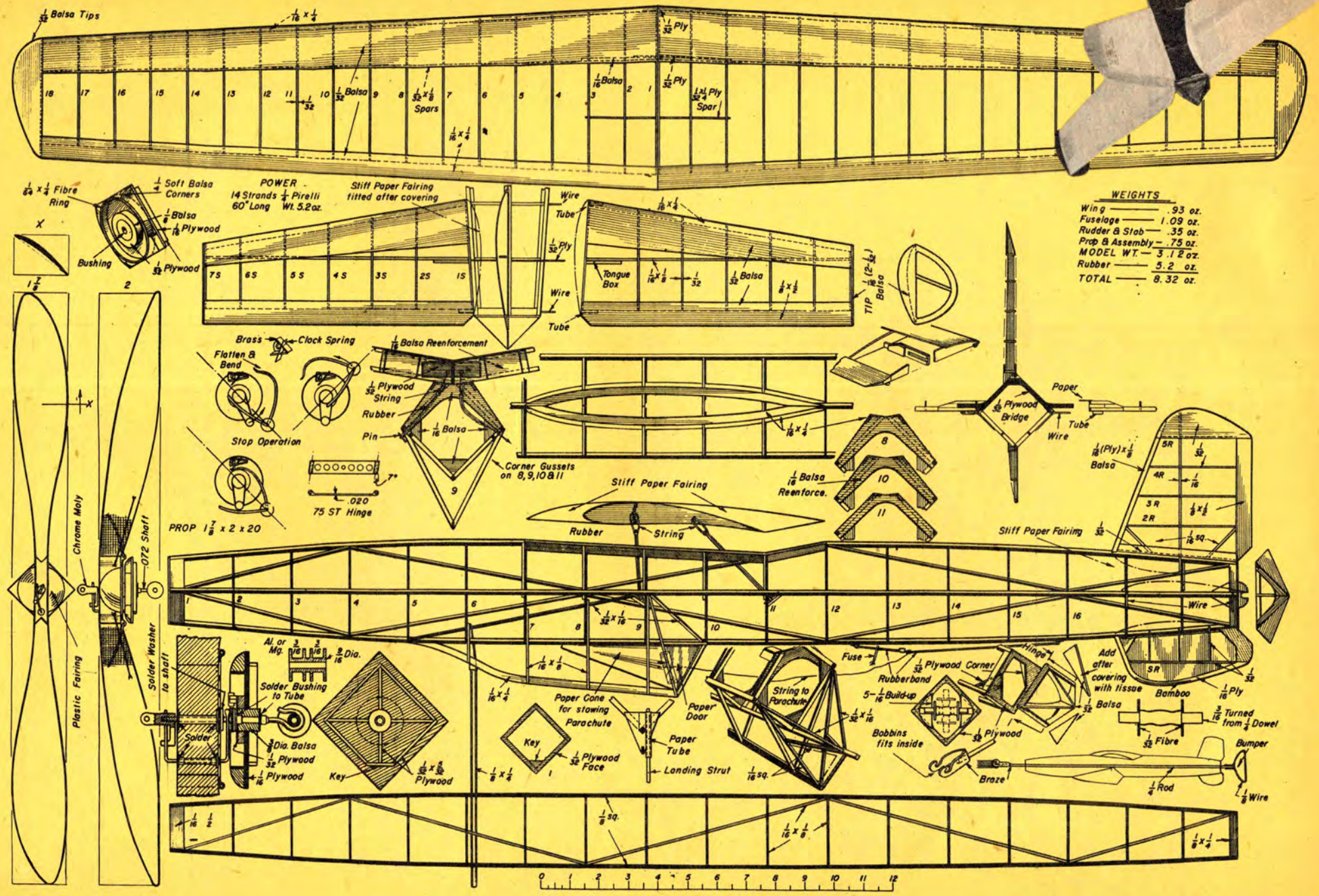
A.T.: "We gather that your club, the Detroit Balsa Bugs, is very active since it won the National Club Champ title at Dallas in both 1950 and 1951. Are there other model plane clubs in Detroit?"

P.S.: "The Balsa Bugs are on one side of the city and the Detroit Sky Guys are on the other. Both of them are mainly free flight, but there are several C/L groups in the city, also."

A.T.: "Much Junior activity in your club?"

P.S.: "There sure is! At least a third of our members are Juniors, and we make sure our various club flying activities are planned so the Juniors can join in. For instance, we have worked up a flying program based around a model of 20 in. max. span, and with at least 3 sq. in. of fuselage cross-section. It must have a windshield and landing gear. Kits are O.K. if they meet the specs—the Comet Cricket is one that

(*Continued on page* 75)


Balsa Tips
Ply
Spars
Spar
POWER
14 Strands 1/4 Pirelli
60" Long Wt. 5.2oz.
Soft Balsa Corners
Fibre Ring
Bushing
Plywood
Stiff Paper Fairing fitted after covering
Wire
Tube
Tongue
Box
Balsa
TIP
WEIGHTS
Wing .93 oz.
Fuselage 1.09 oz.
Rudder & Stab .35 oz.
Prop & Assembly .75 oz.
MODEL WT. 3.12 oz.
Rubber 5.2 oz.
TOTAL 8.32 oz.
Brass
Clock Spring
Flatten & Bend
Stop Operation
Balsa Reenforcement
Plywood
String
Rubber
Pin
Corner Gussets on 8,9,10 & 11
Reenforce.
Stiff Paper Fairing
Rubber
String
Paper
Plywood Bridge
Tube
Wire
Balsa
Hinge
PROP 1 7/8 x 2 x 20
Chrome Moly
.072 Shaft
Plastic Fairing
Solder Washer to shaft
Al. or Mg.
Dia.
Solder Bushing to Tube
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Key
Paper Cone for stowing Parachute
Paper Door
Paper Tube
Landing Strut
Key
Plywood Face
Fuse
Plywood Corner
Rubberband
5-Build-up
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Bobbins fits inside
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Add after covering with tissue
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Rod
Wire
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Red's Remarkable Wakefield

■ In response to requests from a great number of interested modelers, we will try to tell all about "Red" Everitt's remarkable model.

The design work alone on this ship took over two months. He tried every kind of rubber, deciding finally that Pirelli was best suited to his set-up since the torque of this particular type of rubber was high after forty or fifty seconds of prop run. This entailed numerous flights on his modified *Zombie*. Keeping weight in mind, Red decided to use a full-length rubber motor. He was warned of the stability problem present on such a set-up, but this didn't stop him.

Force arrangements were carried over from his modified *Zombie*. A definite ratio was determined for nose moment, tail moment, incidence, and so on down the line.

When he decided to use a small tail, the experienced modelers again shook their heads. When he chose a plug-in tail, nothing but trouble was predicted.

The wing selected was of straight taper, using the Joukowski airfoil which Ron Warring recommended. Each rib was plotted so that a true section could be obtained for the full span.

The prop was the result of extensive research. Red used a front side planform which conformed to a circle of predetermined radius. The pitch for each one inch of prop dia. was calculated, then interpolated into a pleasing outline. The prop block was cut to shape before carving; when the carving is finished you have the exact outline. The section used was taken from an overseas publication. The result is a prop of 20 inch dia. and 30 inch pitch.

Early last year broken motors through maximum wind efforts led Red to develop his outside winding method to such a high degree that he can wind his model fully, with no help—in fact he has gone out to the field by himself and made numerous fully wound flights.

The removable prop and unorthodox stop are really simple, complicated as they may look, and they work to perfection. The idea of using *all* the winds in the motor proved good, the removable bobbin allowing Red to pack in maximum winds more easily. He was worried about getting the prop to stop in exactly the same place, flight after flight—this is very important since

THE WESTERN VIEWPOINT

Most talked-of design in Wakefield circles is this Californian's unique craft; it should set the pace for 1952

Designed and flown by ARTHUR G. EVERITT
Described by Dick Everett

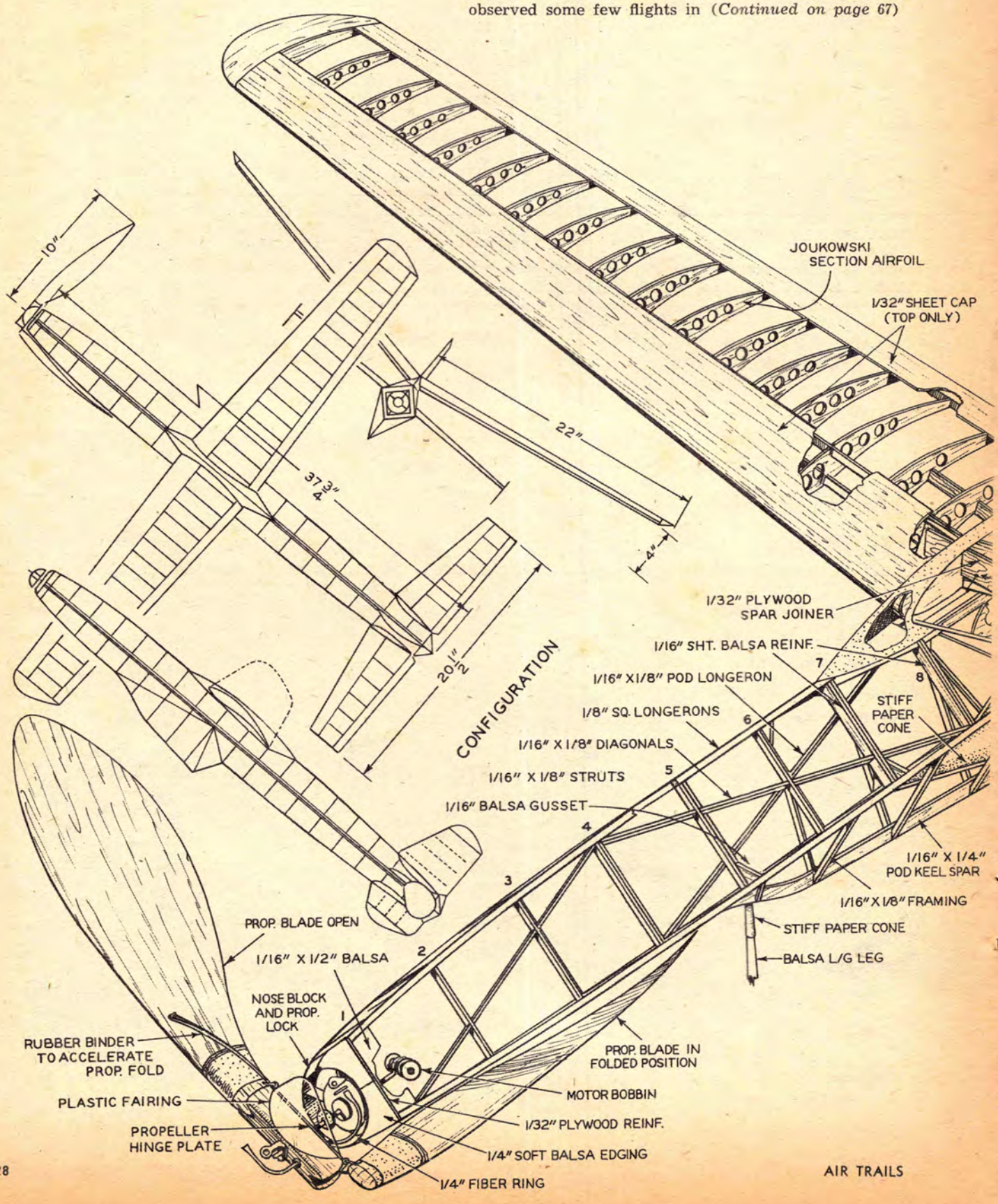
Arthur G. (Red) Everitt is a mechanical and electrical design engineer with the Navy. Started modeling with a Curtiss kit by Ideal in 1916, then dropped out of the activity until '48 when his 8-year-old son George had Mommy buy Pop a Korda kit. Red's unorthodox approach to tough modeling problems has endeared him to West Coast fans.

the glide is more often messed up by a poor fold than any other reason.

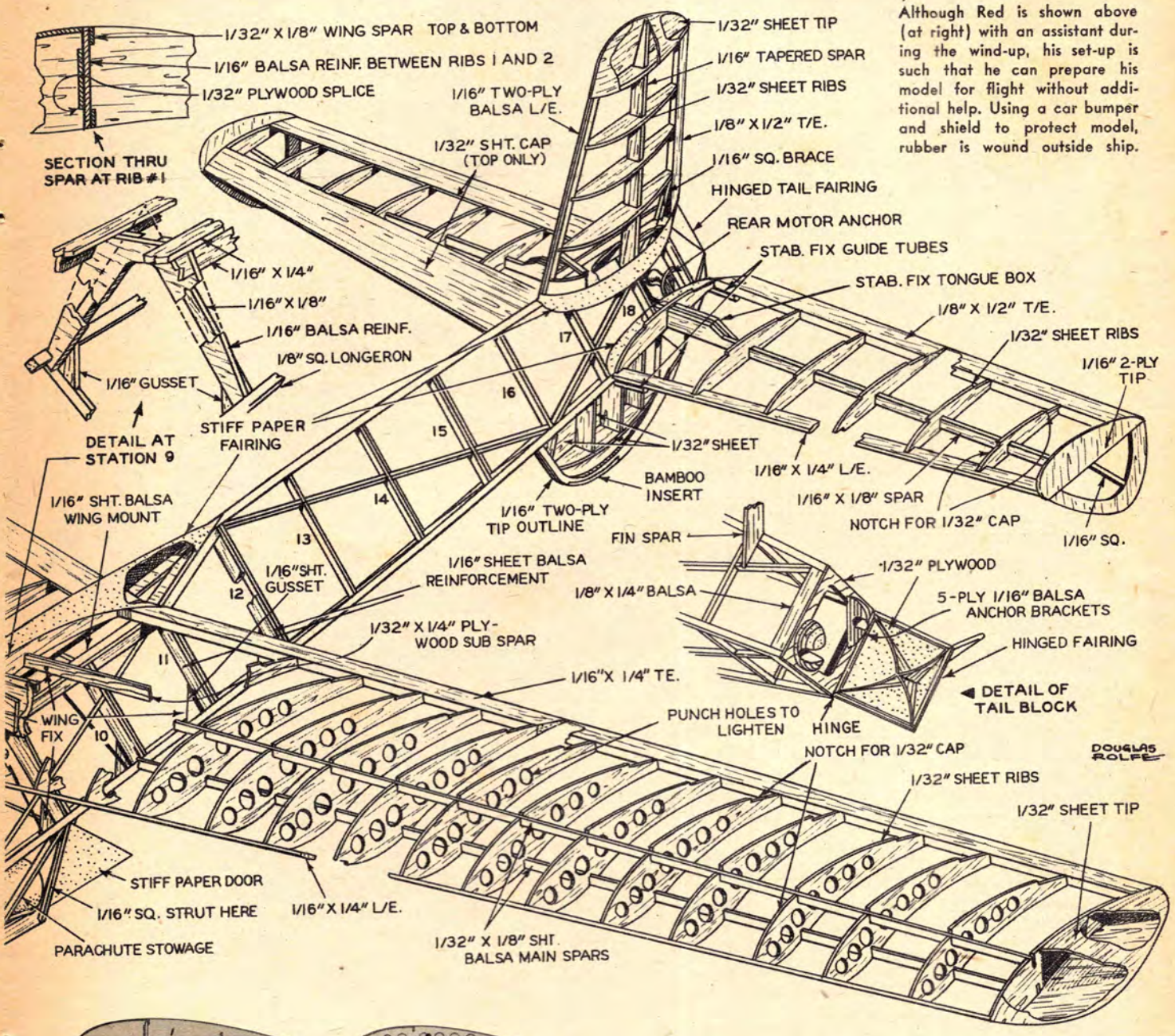
In a big effort to cut down weight all woods used were very light, in some cases too light for everyday flying, so some beefing up was required. He used 1/32" plywood very liberally in places where strength was necessary, saving elsewhere on weight by not using so much balsa as the average builder. All ribs were lightened with holes. The leading edges of the wing and tail were hollowed after construction. The nose block was built up of plywood and balsa. The landing gear is a piece of balsa which breaks off when it meets an obstruction; it weighs only a little more than one gram.

When one disregards the fixed single strut gear the model is very clean. The prop is faired into the fuse, with a thin plastic fairing, wing rubbers are inside the fuse, wetted area of the body is kept small through a bump "a la Jaguar." Wing has a paper fairing. Under full power the model is fast; the glide is fast and smooth.

Prime factor in Red's 1:50 to 2:00 minimum motor run is the exceptionally smooth prop. There is no vibration. This seems very important since we have observed some few flights in (*Continued on page 67*)



Although Red is shown above (at right) with an assistant during the wind-up, his set-up is such that he can prepare his model for flight without additional help. Using a car bumper and shield to protect model, rubber is wound outside ship.



WING SECTIONS INDIVIDUALLY PLOTTED

South of the Border Soarer:

BATIRI

From down Mexico way comes this "engineered" Half-A free flight; original version won 1st at Tangerine Meet

By J. MANUEL TELLEZ

■ When I first seriously considered designing a F/F model that would stand a chance in a large U. S. contest, I came to the conclusion that it would need a skyrocket climb and a slow soaring glide. As we all know, these characteristics are based on contradictory design principles. Every model designer is torn between the two, trying to reach a satisfactory compromise. I began to wonder if there was a way of changing either principle from the usual standards without sacrificing one or the other. After some thought I believe I succeeded in changing both and in incorporating these changes in *Batiri*.

My first aim was to gain maximum altitude during the powered part of the flight. This depended on two factors, the flight path and the speed. The model would gain the most altitude by traveling along a completely vertical flight path at the greatest possible velocity. I first concentrated on obtaining the maximum possible vertical speed and soon realized that it depended mainly on a relationship between power and weight. This can be more clearly understood by studying several mathematical formulas involving power, and starting with the one which defines it: $P = \frac{W \times H}{T}$, where: W = weight in pounds; H = height in feet; T = time in minutes.

In other words, power is equal to foot-pounds per minute. Since one horsepower is equal to 33,000 foot-pounds per minute, we can get horsepower from the previous formula by dividing by 33,000. The formula then becomes: $HP = \frac{W \times H}{33{,}000\ T}$. Since vertical speed is equal to vertical distance or height divided by time, the formula becomes: $H = \frac{W \times S}{33{,}000}$ where: S = vertical speed in feet per minute. Solving the above formula for S, we find: $S = \frac{33{,}000\ HP}{W}$.

For simplicity's sake let us forget the existence of drag. Then from the previous formula we can clearly see that the rate of climb is only affected by the weight of the model, *irrespective of its size,* once the engine has been selected. Logically, we should always use the most powerful engine in a model of the absolute minimum weight that conforms to A.M.A. contest rules.

Getting back to the perfectly vertical flight path, I would first like to draw attention to an interesting fact. The model with the perfectly vertical flight path is not actually flying in the true aerodynamical sense of the word "flight" since the wings and other lifting surfaces are not contributing in any way to supporting the model. To the contrary, they even hinder the model during a vertical climb.

Therefore, these surfaces should be made and located in a manner to interfere as little as possible with the vertical flight of the airplane. To stress this point, I should say that if we could eliminate the wings entirely, the model would reach an even higher altitude. (Food for thought along the line of retracting or folding wings.)

After several experiments I found that the best way to obtain the vertical flight path was to permit the model to rotate about its longitudinal axis during the climb. It is important that the model does not have a tendency to turn while under power. Since the nose is pointed straight up, any turning tendency will make the model end up by diving into the ground. Any rolling (banking) tendency will not affect the vertical flight path. For this reason, it is important to try to eliminate any side thrust engine adjustments. The model should also nose up as fast as possible after the take-off. Should the model take too long to nose up, it would probably spiral into the ground due to the roll adjustment.

Briefly reviewing the desirable characteristics dur-

ing the power run, we see that we should have: A) the lightest possible model. B) a vertical climbing model with a banking tendency but with no turning tendency.

The design principles behind the second part of the flight, almost entirely oppose these of the first. There is one exception on which they agree, minimum weight. We already have seen that the lighter the model, the greater the climb. In the second part of the flight, lightness limits the sinking rate, thereby increasing the duration.

The first controversy arose while determining the size of the model. The larger the lifting surfaces, the longer the flight. Yet exceptional size would slow down the vertical climb. I finally decided to sacrifice some speed during the ascent and build the largest possible model which would still conform to minimum A.M.A. weight specifications.

For example, in order to build a "B" ship for a .29 engine, I experimented until I found the largest model which would weigh no more than 29 ounces. The approximate results were as follows: For class AA (0.049)—175 to 200 sq. in. For class A (0.19)—600 to 700 sq. in. For class B-C (0.29-0.31)—900 sq. in. For class C (0.64)—Lord, behold!

The design of a model which, in spite of its size compared to its weight, is still strong, warp-proof, and flutter-proof requires a careful study of the airframe. All unnecessary material must be eliminated to keep the weight down. I studied every piece of the structure and cut out everything not considered essential.

The design soon reached another point of controversy. It is generally agreed that as far as glide is concerned, the higher the aspect ratio, the better the wing efficiency. Yet, a high aspect ratio introduces a serious structural problem for which I, frankly, found no satisfactory solution. A second deficiency of a high aspect ratio is its tendency to stop roll. As I said before, the model requires roll to aid stability during its vertical climb.

After trying several wing layouts I finally compromised with a 5.33:1 aspect ratio. This wing I divided into four panels of the same length which when joined with dihedral approximate the arc of a circle. The two center panels are of a constant chord. The tip panels are tapered in a .3:1 ratio to avoid tip flutter. These tip panels are terminated with a set of "end plates" which I found very effective in increasing wing efficiency. As a matter of fact, the use of these tip plates gives this 5.33:1 AR wing approximately the same performance of a 7:1 AR wing.

For an airfoil section I used an Eiffel 431 cut down to 85 per cent of its original thickness. I chose this section because I have often used it and am familiar with its behavior. On my next wing I shall try out an airfoil of the type Frank Ehling is using with a sharp leading edge and a flat bottom. I won't expect much improvement in lift (glide), but it might cut down drag at high speed and let the model climb even faster.

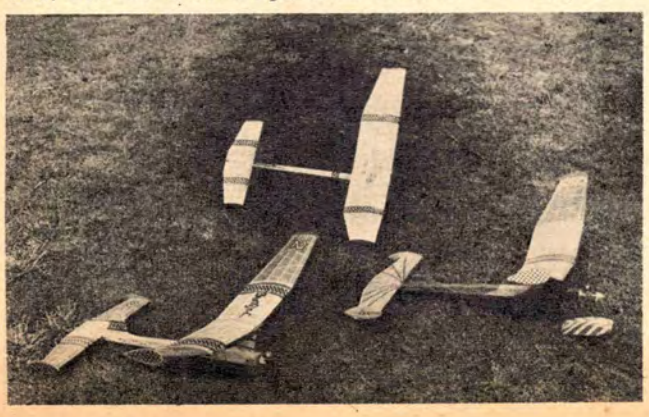
A certain amount of longitudinal dihedral (difference in angle of incidence between the wing and tail) is necessary to get enough longitudinal stability and to reduce the stalling tendency at the end of the climb. Unfortunately, the greater the longitudinal dihedral the greater will be the drag or opposition to climb during the powered flight.

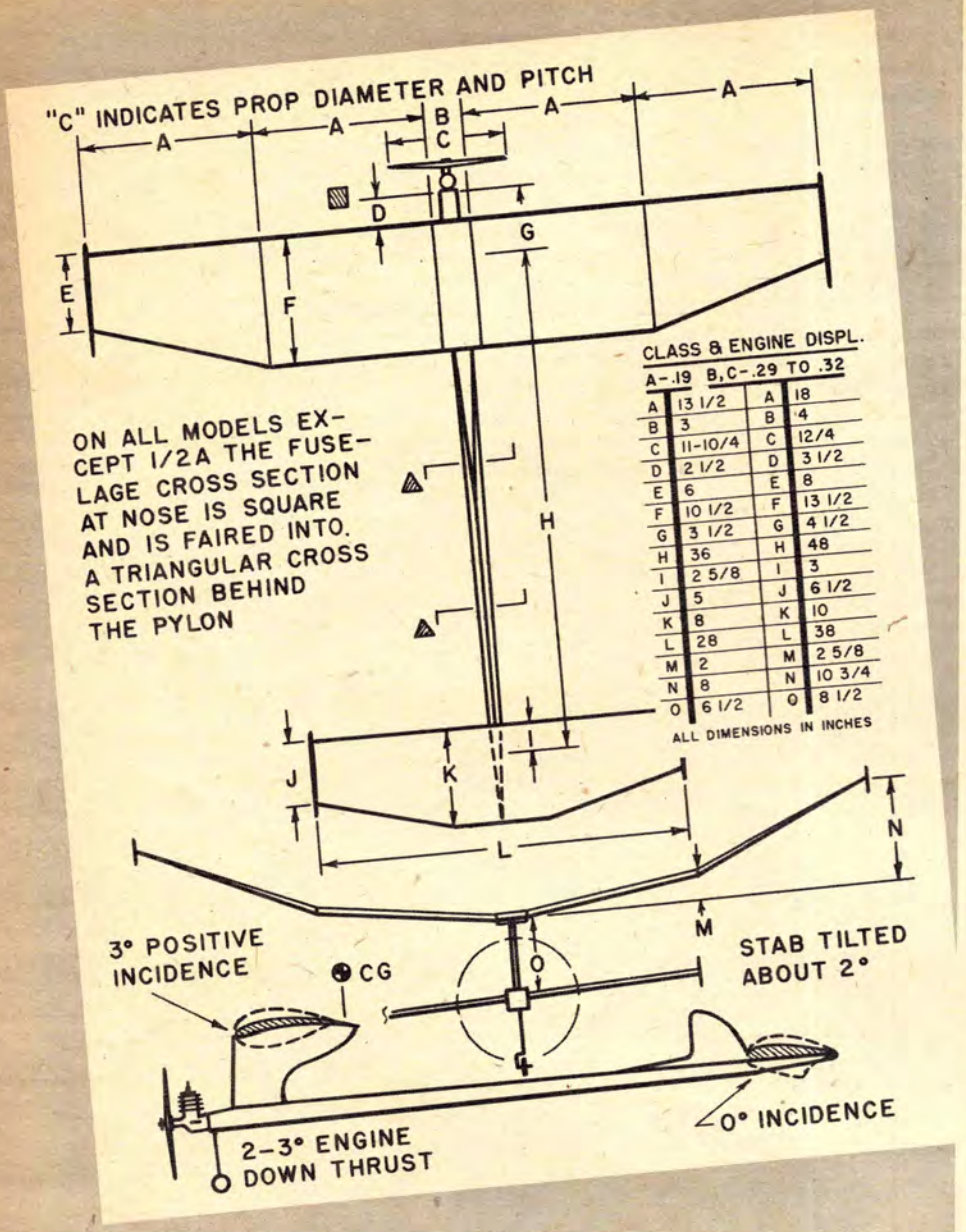
Therefore, I had to compromise at a point suitable to both powered and unpowered conditions. I found that the best arrangement was to set the stabilizer at zero degrees and the wing between two and three degrees. If while adjusting I found the model called for a setting outside of these limits, I would correct it by changing the position of the center of gravity.

To obtain the fast nosing-up tendency previously mentioned, a relatively high pylon is advisable. I adjusted the lateral area of the pylon experimentally until the turning tendency was corrected without resorting to side thrust adjustments. Regarding this, the effect of the pylon area is due to the prop wash striking this surface.

Two other points should be kept in mind to get a stable vertical climb. They are the tail moment-arm and the stabilizer. We can better understand their effect by remembering the flight of an arrow. To be stable, an arrow has to have guiding vanes at its rear. Without vanes it would not be possible to keep it traveling along a steady course. In other words, the greatest part of the drag and guiding elements should be located at the rear. The farther back the better.

Some of the most colorful entries at the last Dallas Nationals were these flown by Tellez, one of the "model" representatives from Mexico pictured here at start of official flight during the American Nationals. Dimension chart for constructing larger versions of the Batiri is given on following page. "Batiri" means bebop. In appearance, dress and model design, author resembles US's Denny Davis.





During vertical flight both the fin and the stabilizer act as guiding vanes. The farther back they are located the greater will be their stabilizing action. I would also venture to say that the stabilizer should be relatively thick to create enough drag to further assure vertical flight path stability.

After several cut and try experiences, I settled for a 35-40 per cent stabilizer with a full Clark "Y" or Goettingen 436 airfoil and a 60-70 per cent tail moment-arm. I also preferred a permanently fixed rudder with a neutral setting placed in front of the stabilizer.

In laying out *Batiri*, I tried to keep the overall drag down as much as possible. Since frontal area plays such an important part, I kept it at a minimum by designing the thinnest possible fuselage and pylon. I also gave careful consideration to the mounting of such gadgets as timers, the fuel tank, the dethermalizer and motor mounts. A cowled engine would have helped; yet, I preferred to lose its benefits for better engine accessibility.

As a last design recommendation, I want to mention mechanical stability. By this, I really mean the model's overall strength. Though light, simple, and easy to repair, it must not warp in hot or cold, damp or dry weather. It must not twist or flutter under strains imposed by flight. It must be a model where wing stab and engine settings can always be reproduced. It must be able to withstand the stress imposed by a dethermalized landing and have enough ground stability to allow safe R.O.G. take-offs.

The airframe must be logically designed. All possible stresses and the structures to withstand them must be studied. Wherever possible structural triangles should be formed. (A triangular structure element is statically indeformable.) Even the covering should be given careful consideration. No detail should be overlooked to produce maximum mechanical stability.

You will find the building of *Batiri* relatively simple and should not encounter any major problems. Nevertheless, I would like to make some suggestions which should make the construction even easier.

The most important factor is the proper selection of balsa wood. It should be very light with the exception of the wing spars and the four fuselage longerons which should be of medium-hard, straight-grain balsa.

The fuselage is of the usual rubber model type. With regard to this I have only one recommendation. Do not omit the diagonal braces. These are vital to the plane's strength.

The pylon is ⅛" thick and should be formed by two pieces of 1/16" sheet balsa glued cross-grain. The wing platform is made in the same way.

Bend the landing gear from 3/64" piano wire, sew with thread and glue to a small piece of 1/32" plywood. Cement this assembly to the front bottom part of the fuselage. Plank the top and bottom nose section. Then cut out a slot to slide the pylon into place. Make sure that the platform has the proper angle of incidence. Once the pylon is in place, complete the nose planking as indicated on the drawing. Cement the dowels for the wing, the stab and the engine supporting rubber bands into place. Notch wherever necessary.

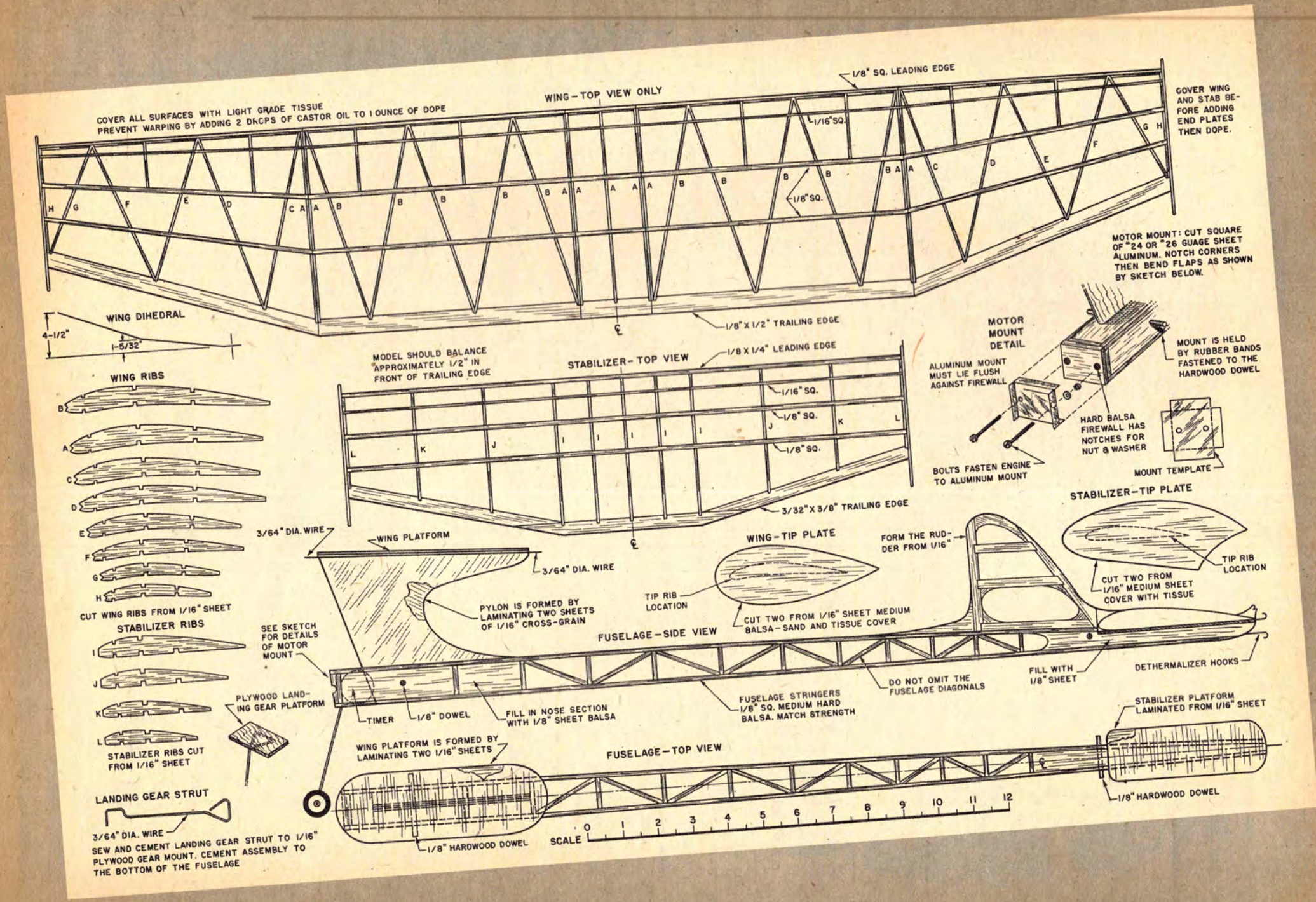
The stabilizer and rudder are of straightforward construction. So is the wing except for the diagonal ribs. These cause no extra trouble once you get used to them.

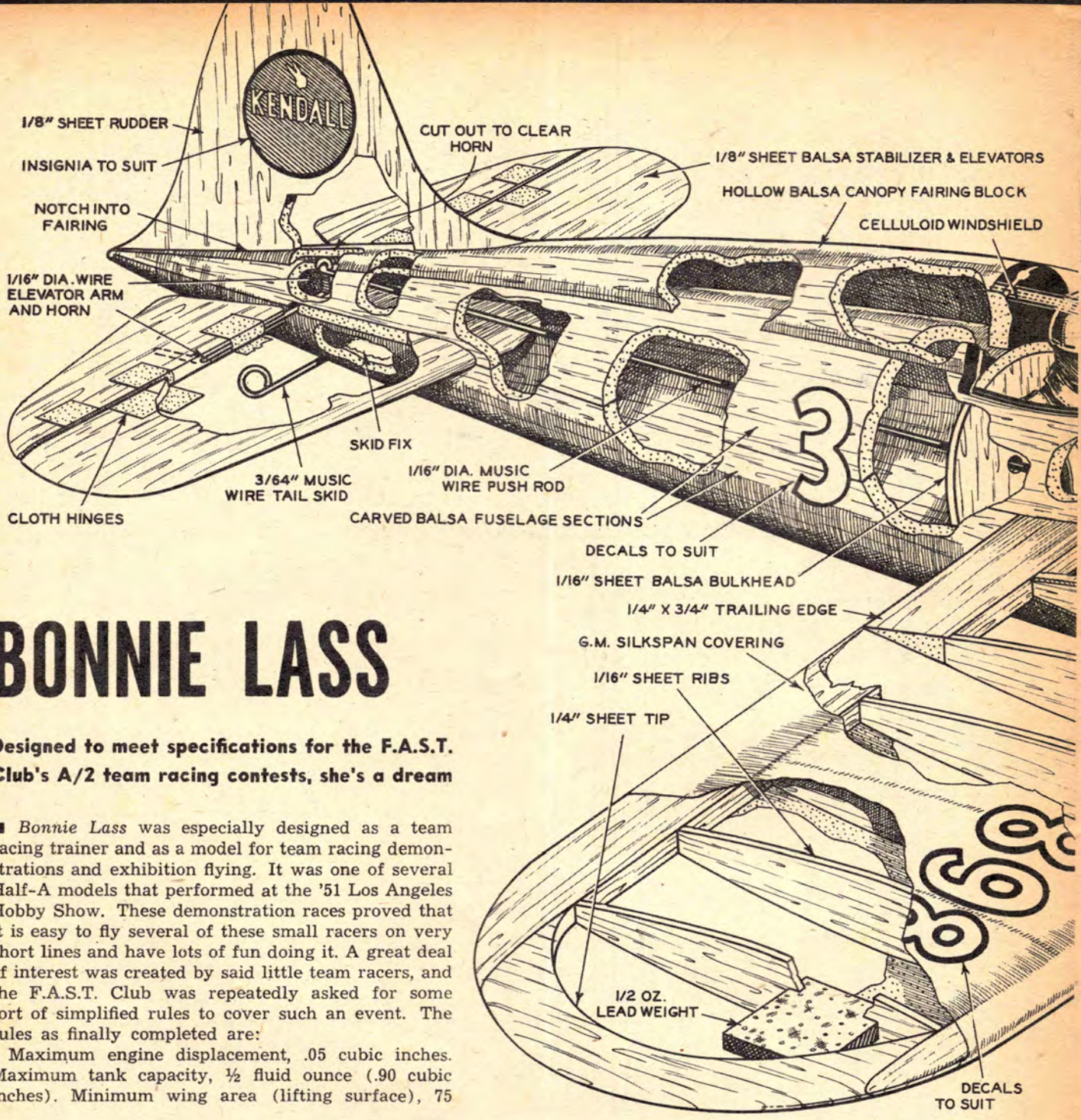
The wing and tail should be covered before the "end plates" are glued on, but dope should not be applied until these plates have been fastened. This prevents the tip ribs from bending in as the covering tightens.

A very practical and durable motor mount can be formed as shown on the drawings. Cut a rectangle out of #24 or #26 gauge sheet aluminum, and notch out the four corners. Bend two flaps to fit over the top and bottom of the fuselage, and bend the other two in the opposite direction. Bolt the engine onto this mount. This entire assembly can be quickly fastened to the fuselage by wrapping rubber bands around the two vertical motor mount flaps and the dowel located behind the timer.

In addition to a better appearance a good finish reduces drag. It also adds life to the model allowing dust and oil to be wiped off easily before they can soak into the structure.

It is most advisable to plasticize the dope by adding a few drops of castor oil. This will prevent warping. When assembled, *Batiri* should balance approximately a half-inch in front of the wings' trailing edge. Adjusting the ship should not be difficult if you follow the procedure outlined. First test glide over grass until a straight flat glide is obtained. Make sure the model has no stalling tendencies. (*Continued on page 68*)


COVER ALL SURFACES WITH LIGHT GRADE TISSUE
PREVENT WARPING BY ADDING 2 DROPS OF CASTOR OIL TO 1 OUNCE OF DOPE
WING - TOP VIEW ONLY
1/8" SQ. LEADING EDGE
1/16" SQ.
1/8" SQ.
1/8" X 1/2" TRAILING EDGE
COVER WING AND STAB BEFORE ADDING END PLATES THEN DOPE.
MOTOR MOUNT: CUT SQUARE OF #24 OR #26 GUAGE SHEET ALUMINUM. NOTCH CORNERS THEN BEND FLAPS AS SHOWN BY SKETCH BELOW.
WING DIHEDRAL
4-1/2"
1-5/32"
MODEL SHOULD BALANCE APPROXIMATELY 1/2" IN FRONT OF TRAILING EDGE
STABILIZER - TOP VIEW
1/8 X 1/4" LEADING EDGE
1/16" SQ.
1/8" SQ.
1/8" SQ.
3/32" X 3/8" TRAILING EDGE
MOTOR MOUNT DETAIL
ALUMINUM MOUNT MUST LIE FLUSH AGAINST FIREWALL
MOUNT IS HELD BY RUBBER BANDS FASTENED TO THE HARDWOOD DOWEL
HARD BALSA FIREWALL HAS NOTCHES FOR NUT & WASHER
BOLTS FASTEN ENGINE TO ALUMINUM MOUNT
MOUNT TEMPLATE
WING RIBS
CUT WING RIBS FROM 1/16" SHEET
STABILIZER RIBS
STABILIZER RIBS CUT FROM 1/16" SHEET
3/64" DIA. WIRE
WING PLATFORM
3/64" DIA. WIRE
PYLON IS FORMED BY LAMINATING TWO SHEETS OF 1/16" CROSS-GRAIN
WING-TIP PLATE
TIP RIB LOCATION
CUT TWO FROM 1/16" SHEET MEDIUM BALSA - SAND AND TISSUE COVER
FORM THE RUDDER FROM 1/16"
STABILIZER-TIP PLATE
TIP RIB LOCATION
CUT TWO FROM 1/16" MEDIUM SHEET COVER WITH TISSUE
SEE SKETCH FOR DETAILS OF MOTOR MOUNT
FUSELAGE - SIDE VIEW
PLYWOOD LANDING GEAR PLATFORM
TIMER
1/8" DOWEL
FILL IN NOSE SECTION WITH 1/8" SHEET BALSA
FUSELAGE STRINGERS 1/8" SQ. MEDIUM HARD BALSA. MATCH STRENGTH
DO NOT OMIT THE FUSELAGE DIAGONALS
FILL WITH 1/8" SHEET
DETHERMALIZER HOOKS
LANDING GEAR STRUT
3/64" DIA. WIRE
SEW AND CEMENT LANDING GEAR STRUT TO 1/16" PLYWOOD GEAR MOUNT. CEMENT ASSEMBLY TO THE BOTTOM OF THE FUSELAGE
WING PLATFORM IS FORMED BY LAMINATING TWO 1/16" SHEETS
FUSELAGE - TOP VIEW
STABILIZER PLATFORM LAMINATED FROM 1/16" SHEET
1/8" HARDWOOD DOWEL
1/8" HARDWOOD DOWEL
SCALE
0 1 2 3 4 5 6 7 8 9 10 11 12

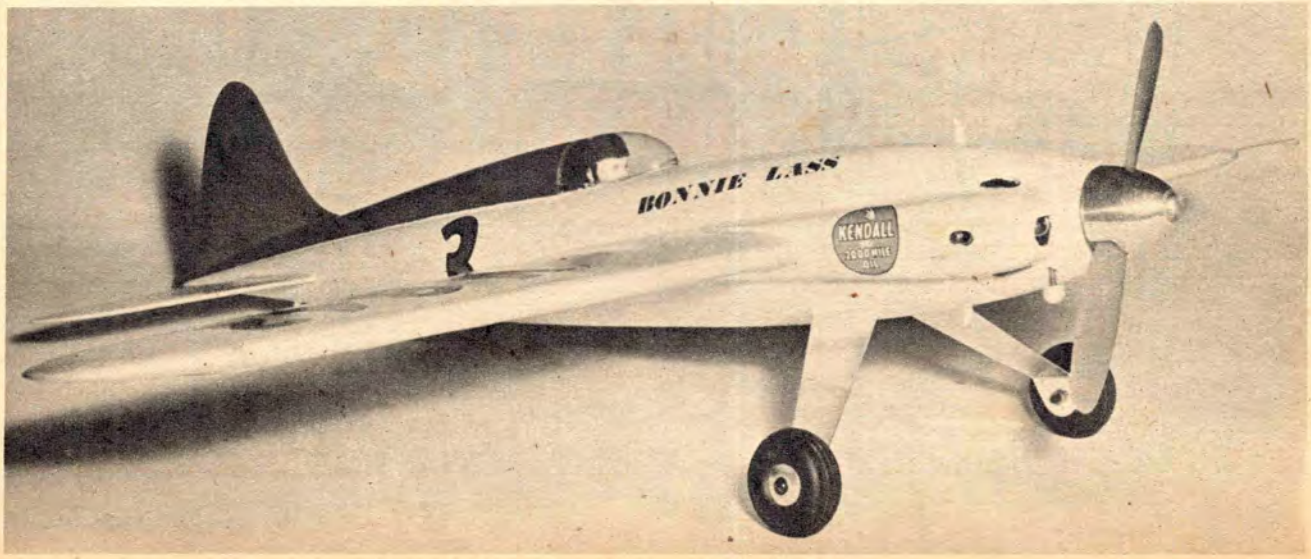


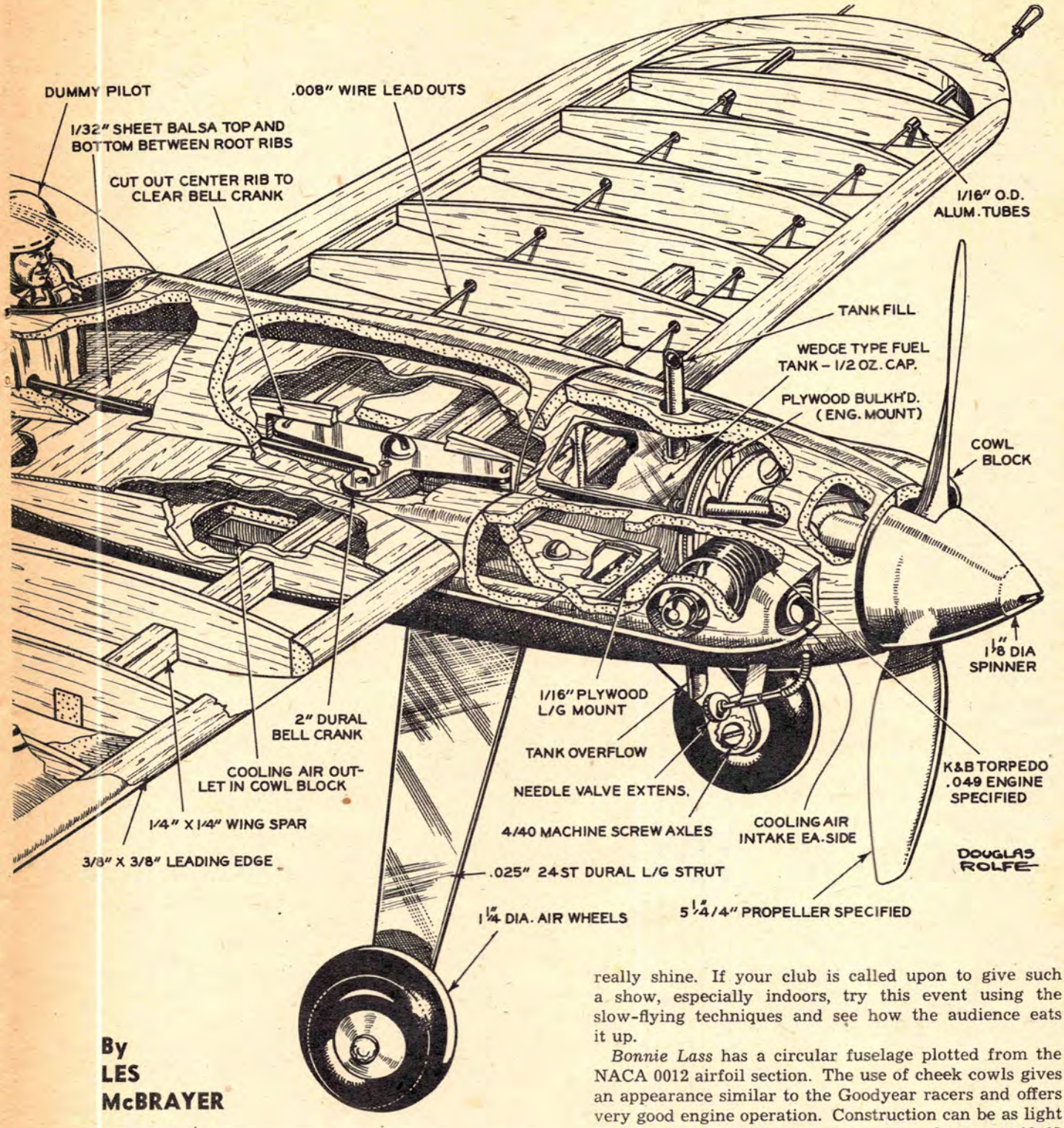
BONNIE LASS

Designed to meet specifications for the F.A.S.T. Club's A/2 team racing contests, she's a dream

■ *Bonnie Lass* was especially designed as a team racing trainer and as a model for team racing demonstrations and exhibition flying. It was one of several Half-A models that performed at the '51 Los Angeles Hobby Show. These demonstration races proved that it is easy to fly several of these small racers on very short lines and have lots of fun doing it. A great deal of interest was created by said little team racers, and the F.A.S.T. Club was repeatedly asked for some sort of simplified rules to cover such an event. The rules as finally completed are:

Maximum engine displacement, .05 cubic inches. Maximum tank capacity, ½ fluid ounce (.90 cubic inches). Minimum wing area (lifting surface), 75




DUMMY PILOT
.008" WIRE LEAD OUTS
1/32" SHEET BALSA TOP AND BOTTOM BETWEEN ROOT RIBS
CUT OUT CENTER RIB TO CLEAR BELL CRANK
1/16" O.D. ALUM. TUBES
TANK FILL
WEDGE TYPE FUEL TANK – 1/2 OZ. CAP.
PLYWOOD BULKH'D. (ENG. MOUNT)
COWL BLOCK
1⅛" DIA SPINNER
1/16" PLYWOOD L/G MOUNT
2" DURAL BELL CRANK
TANK OVERFLOW
COOLING AIR OUT-LET IN COWL BLOCK
NEEDLE VALVE EXTENS.
K&B TORPEDO .049 ENGINE SPECIFIED
1/4" X 1/4" WING SPAR
4/40 MACHINE SCREW AXLES
COOLING AIR INTAKE EA. SIDE
3/8" X 3/8" LEADING EDGE
.025" 24-ST DURAL L/G STRUT
1¼ DIA. AIR WHEELS
5¼/4" PROPELLER SPECIFIED
DOUGLAS ROLFE

By LES McBRAYER

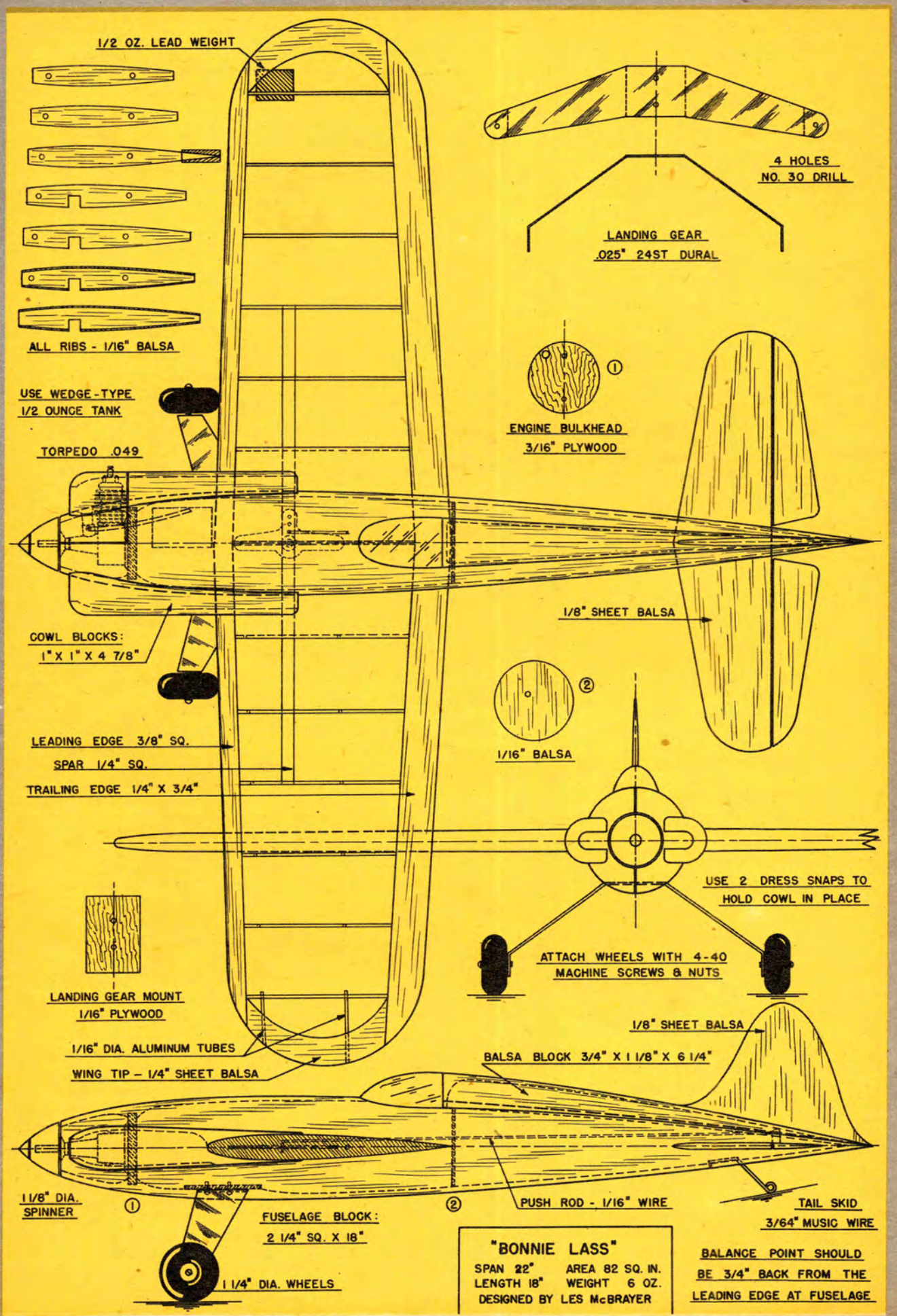
square inches. Minimum cross section at cockpit, 1¼" x 1½". No engine cut-off required. Realistic design, cowled engine, fixed gear, dummy pilot. Line length, 26' 3". (This gives 32 laps per mile). Races for 2, 3, or 4 models in 1 mile and 2 mile heat races. Final race for distance of 5 miles.

Half-A team racers should have a very definite place in model flying. They can be used to learn the fundamentals of team flying. Such models are inexpensive, simple to construct, and can fly slow enough so that the pilot can accurately control the flight. For small club contests, A/2 contests can be lots of fun. But it is in exhibition or demonstration flying that these models really shine. If your club is called upon to give such a show, especially indoors, try this event using the slow-flying techniques and see how the audience eats it up.

Bonnie Lass has a circular fuselage plotted from the NACA 0012 airfoil section. The use of cheek cowls gives an appearance similar to the Goodyear racers and offers very good engine operation. Construction can be as light as 5 ounces for mild stunt flying or as heavy as 10-12 ounces for slow-flying and indoor flying.

For slow-flying and demonstrations, first add weight to the model until it weighs about 10 to 12 ounces, but be very careful to keep the balance point exactly the same as before. Take an aluminum "Firebaby" prop and reduce the pitch to about 1½ or 2 inches. Make a long, smooth take-off and then after a few laps of normal flying, slowly and gradually pull up the nose and at the same time apply a slight backward tow on the lines. Model should slow down into a semi-stall and hold its altitude at a speed approximately half of normal.

Then gradually bring the nose down to level and apply a slight forward tow on the (*Continued on page 60*)


1/2 OZ. LEAD WEIGHT
ALL RIBS - 1/16" BALSA
4 HOLES
NO. 30 DRILL
LANDING GEAR
.025" 24ST DURAL
USE WEDGE-TYPE
1/2 OUNCE TANK
TORPEDO .049
ENGINE BULKHEAD
3/16" PLYWOOD
1/8" SHEET BALSA
COWL BLOCKS:
1" X 1" X 4 7/8"
1/16" BALSA
LEADING EDGE 3/8" SQ.
SPAR 1/4" SQ.
TRAILING EDGE 1/4" X 3/4"
USE 2 DRESS SNAPS TO
HOLD COWL IN PLACE
ATTACH WHEELS WITH 4-40
MACHINE SCREWS & NUTS
LANDING GEAR MOUNT
1/16" PLYWOOD
1/8" SHEET BALSA
1/16" DIA. ALUMINUM TUBES
BALSA BLOCK 3/4" X 1 1/8" X 6 1/4"
WING TIP - 1/4" SHEET BALSA
1 1/8" DIA.
SPINNER
PUSH ROD - 1/16" WIRE
TAIL SKID
3/64" MUSIC WIRE
FUSELAGE BLOCK:
2 1/4" SQ. X 18"
1 1/4" DIA. WHEELS
"BONNIE LASS"
SPAN 22" AREA 82 SQ. IN.
LENGTH 18" WEIGHT 6 OZ.
DESIGNED BY LES McBRAYER
BALANCE POINT SHOULD
BE 3/4" BACK FROM THE
LEADING EDGE AT FUSELAGE

THE EASTERN VIEWPOINT

What the Westerners are doing is illustrated by Red Everitt's model; here's view of East

Winning the Wakefield

By PAUL E. DEL GATTO

■ It won't be long now before we will be preparing for the 1952 Wakefield Eliminations. Design discussions seem to revolve about three major items: return gears, a long fuselage with a taut motor, or a conventional layout with a braided motor to take up the slack.

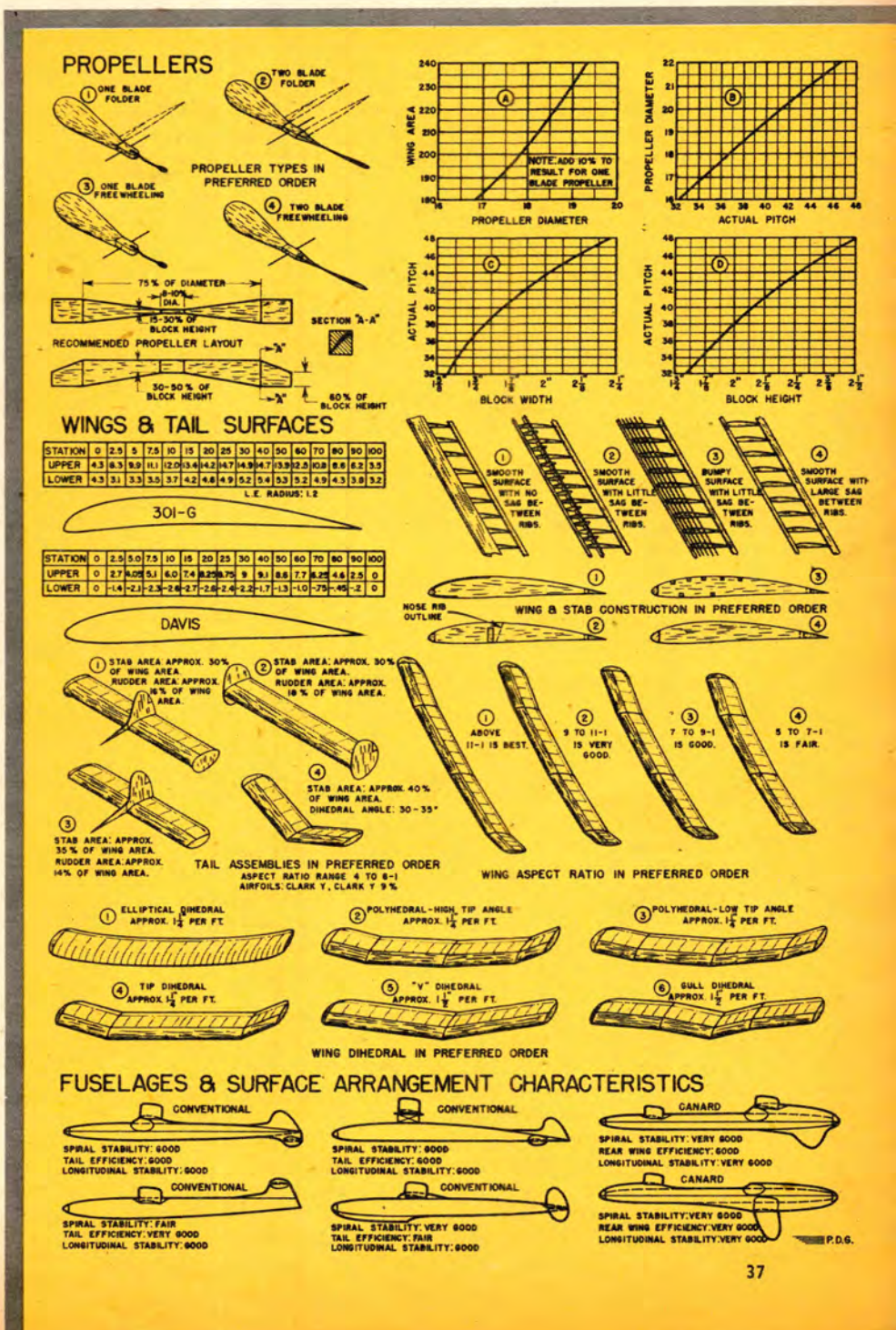
Back in 1937 Emmanuel Fillon of France won the Wakefield. Among the most notable features of his design were the freewheeling propeller, diamond-shaped fuselage, R.A.F. 32 single-spar wing and Clark Y stabilizer. That same year, Alfred Van Wymersch, then representing the Belgium team (now member of L.I. Prop Spinners and first place winner in 1951, New York Area, Wakefield Eliminations) had a streamlined Wakefield design. Among the notable features were the freewheeling propeller, two-geared motors, hollowed-out balsa fuselage, an R.A.F. single-spar wing and a symmetrical stabilizer. Single and double blade folding propellers also came into view in 1937, though there was none among the top winners. It was not until the following year in 1938 that folding propellers proved their worth.

This was the year that Jim Cahill, a member of the American team, won the coveted Wakefield Cup at Guyencourt, France. Aside from the folding prop his model had a monocoque fuselage featuring a deep belly from which extended a stumpy landing gear. The wing airfoil resembled a modified R.A.F. 32, but could very well have been an Eiffel 400. The stabilizer featured a high lift undercambered airfoil.

The following year Dick Korda won the Cup. Perhaps Korda's model more than any other represents what was being built up until the time the rules were changed for the 1951 Wakefield Internationals. Korda's ship had a single-blade folding propeller, slabsider cabin type fuselage, and the lightweight multi-spar wing which featured an R.A.F. 32 Section. The multi-spar stabilizer had a flat bottom lifting airfoil which resembled a thin Clark Y.

Thus, in the three years from 1937-39, we have evidenced all of the outstanding features found in American Wakefield designs of today with but one exception. That exception is the long fuselage with the taut motor. If the rules changes had come about some fifteen years ago, we would have undoubtedly witnessed the super-long fuselage at that time as well.

Since the fundamental objective in


PROPELLERS
1 ONE BLADE FOLDER
2 TWO BLADE FOLDER
PROPELLER TYPES IN PREFERRED ORDER
3 ONE BLADE FREEWHEELING
4 TWO BLADE FREEWHEELING
75% OF DIAMETER
8-10% DIA.
15-30% OF BLOCK HEIGHT
SECTION "A-A"
RECOMMENDED PROPELLER LAYOUT
30-50% OF BLOCK HEIGHT
60% OF BLOCK HEIGHT
WING AREA
PROPELLER DIAMETER
NOTE: ADD 10% TO RESULT FOR ONE BLADE PROPELLER
PROPELLER DIAMETER
ACTUAL PITCH
ACTUAL PITCH
BLOCK WIDTH
ACTUAL PITCH
BLOCK HEIGHT
WINGS & TAIL SURFACES
STATION 0 2.5 5 7.5 10 15 20 25 30 40 50 60 70 80 90 100
UPPER 4.3 8.3 9.9 11.1 12.0 13.4 14.2 14.7 14.9 14.7 13.9 12.5 10.8 8.6 6.2 3.5
LOWER 4.3 3.1 3.3 3.5 3.7 4.2 4.8 4.9 5.2 5.4 5.3 5.2 4.9 4.3 3.8 3.2
L.E. RADIUS: 1.2
301-G
STATION 0 2.5 5.0 7.5 10 15 20 25 30 40 50 60 70 80 90 100
UPPER 0 2.7 4.05 5.1 6.0 7.4 8.25 8.75 9 9.1 8.6 7.7 6.25 4.6 2.5 0
LOWER 0 -1.4 -2.1 -2.3 -2.6 -2.7 -2.8 -2.6 -2.2 -1.7 -1.3 -1.0 -.75 -.45 -.2 0
DAVIS
1 STAB AREA APPROX. 30% OF WING AREA. RUDDER AREA APPROX. 16% OF WING AREA.
2 STAB AREA: APPROX. 30% OF WING AREA. RUDDER AREA: APPROX. 18% OF WING AREA.
3 STAB AREA: APPROX. 35% OF WING AREA. RUDDER AREA APPROX. 14% OF WING AREA.
4 STAB AREA: APPROX. 40% OF WING AREA. DIHEDRAL ANGLE: 30-35°
TAIL ASSEMBLIES IN PREFERRED ORDER
ASPECT RATIO RANGE 4 TO 6-1
AIRFOILS: CLARK Y, CLARK Y 9%
1 SMOOTH SURFACE WITH NO SAG BETWEEN RIBS.
2 SMOOTH SURFACE WITH LITTLE SAG BETWEEN RIBS.
3 BUMPY SURFACE WITH LITTLE SAG BETWEEN RIBS.
4 SMOOTH SURFACE WITH LARGE SAG BETWEEN RIBS.
NOSE RIB OUTLINE
WING & STAB CONSTRUCTION IN PREFERRED ORDER
1 ABOVE 11-1 IS BEST.
2 9 TO 11-1 IS VERY GOOD.
3 7 TO 9-1 IS GOOD.
4 5 TO 7-1 IS FAIR.
WING ASPECT RATIO IN PREFERRED ORDER
1 ELLIPTICAL DIHEDRAL APPROX. 1½ PER FT.
2 POLYHEDRAL - HIGH TIP ANGLE APPROX. 1½ PER FT.
3 POLYHEDRAL - LOW TIP ANGLE APPROX. 1½ PER FT.
4 TIP DIHEDRAL APPROX. 1½ PER FT.
5 "V" DIHEDRAL APPROX. 1½ PER FT.
6 GULL DIHEDRAL APPROX. 1½ PER FT.
WING DIHEDRAL IN PREFERRED ORDER
FUSELAGES & SURFACE ARRANGEMENT CHARACTERISTICS
CONVENTIONAL
SPIRAL STABILITY: GOOD
TAIL EFFICIENCY: GOOD
LONGITUDINAL STABILITY: GOOD
CONVENTIONAL
SPIRAL STABILITY: GOOD
TAIL EFFICIENCY: GOOD
LONGITUDINAL STABILITY: GOOD
CANARD
SPIRAL STABILITY: VERY GOOD
REAR WING EFFICIENCY: GOOD
LONGITUDINAL STABILITY: VERY GOOD
CONVENTIONAL
SPIRAL STABILITY: FAIR
TAIL EFFICIENCY: VERY GOOD
LONGITUDINAL STABILITY: GOOD
CONVENTIONAL
SPIRAL STABILITY: VERY GOOD
TAIL EFFICIENCY: FAIR
LONGITUDINAL STABILITY: GOOD
CANARD
SPIRAL STABILITY: VERY GOOD
REAR WING EFFICIENCY: VERY GOOD
LONGITUDINAL STABILITY: VERY GOOD
P.D.G.

any Wakefield model is one of design, then why not endeavor to improve our designs? Let us get out of the "configuration stalemate." Perhaps in this manner we will be able to develop the type of model we have been dreaming about. Not a calm weather, windy weather, or damp weather model Wakefield design, but an all-weather design capable of high times under any conditions. We have evolved several configurations that we feel could very well be the basis for a design that could bring the Wakefield Cup to these shores again.

The first of these is the Push-Pull for an extremely long motor run in conjunction with high altitude. By using two propellers, each operating from its own motor, the average rpm could be reduced approximately 25 percent while the total power required would be no more than is generally found in a single propeller model. Each rubber motor would require approximately half the number of strands to produce a large increase in the turn capacity. The average rpm will be some 25 percent less than would be required in a single propeller model.

With the test model we had built, our prime objective was to see whether we could achieve a two-minute motor run at a moderate rate of climb.

The motor run is closer to 2½ minutes, despite the fact that the model is built extremely rugged and weighs close to 12 ounces. The glide, contrary to what we had expected, was still comparable to the majority of Wakefield models we have seen. The model will climb as high as any other Wakefield, though it will do it over a longer period of time. Trimming the model for flight did not give trouble despite the rearward position of the wing. This is due to the fact that torque, the old bugaboo, was eliminated through the use of counter-rotating propellers.

Although we feel the Push-Pull Arrangement was the key to the success of the design, there were other contributing factors. Take for example the propellers which by today's standards are extremely large.

Low and medium pitch diameter and blade area propellers still being used extensively are inadequate to meet the demands imposed upon them for higher performance. A factor which appears to overly influence us is the minimum required weight of a Wakefield model. The general trend has been toward designing propellers sufficiently large to bring the model up to minimum weight specifications. Thus, more often than not we do not obtain the best balance between propeller, motor run and design for achieving peak performance.

As for other contributing factors to the model's performance, we would select the design and construction of the wing. The airfoil section used in this particular design is the 301G, first brought to our attention by Dr. Lippisch. We feel it merits considerably more attention than it has been receiving, not only because of its high lift to drag ratio (L/D), but also because it is easily adaptable to the type of model structure that will enable us to duplicate as much as possible the desired shape and characteristics of the original airfoil.

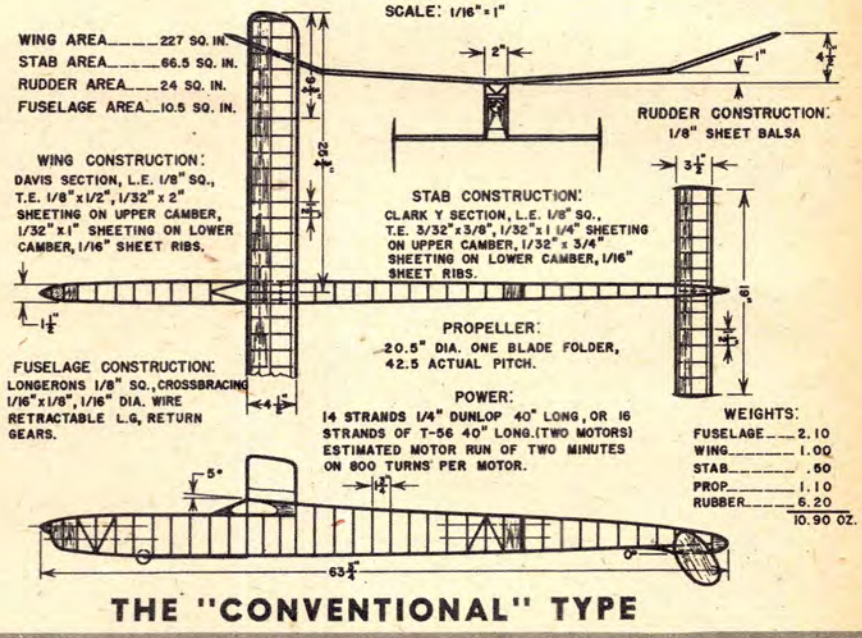
This type of structure employs thin balsa sheeting over the highly curved portions to prevent the covering from sagging between the ribs. Admittedly, the wing and tail structures could have been made lighter by utilizing a large single spar or many small spars throughout the wing without thin balsa sheeting. However, this would have resulted in a section which, to a varying degree (depending on structure used), would have been dissimilar and less efficient than its original counterpart.

The Canard—so termed because tail plane is located forward of the wing—is noted primarily for its superior longitudinal stability with respect to the conventional type of model. If consistency is important in determining a Wakefield winner, we might well consider a Canard configuration solely on the basis of its superior longitudinal stability. However, there are several other reasons why we should give Canards more serious thought.

As an example, its adaptability to a pusher arrangement, which if used would result in absolutely no loss in wing efficiency due to the turbulent air from the rotating propellers flowing over the wing surfaces.

In a Canard the center of gravity (C.G.) will be located forward of the rear wing, the distance being dependent on the relative lift of the forward wing. For the model we have outlined the center of gravity will be forward of the rear wing approximately 30 percent of the distance between the center of lift (C/L.) of both wings. In considering the weight of the model we can readily visualize how the actual center of gravity can be easily located in the desired design position.

Of lesser importance, though not to be discounted in the design of a Canard, is the fact that the configuration enables us to utilize two high lift air foil sections, of which the airfoil that stalls sooner is located in the forward wing. By doing this we obtain an increase in the total lifting force acting on the model with respect to that of a conven-


SCALE: 1/16" = 1"
WING AREA_____227 SQ. IN.
STAB AREA_____66.5 SQ. IN.
RUDDER AREA____24 SQ. IN.
FUSELAGE AREA__10.5 SQ. IN.
WING CONSTRUCTION:
DAVIS SECTION, L.E. 1/8" SQ., T.E. 1/8" x 1/2", 1/32" x 2" SHEETING ON UPPER CAMBER, 1/32" x 1" SHEETING ON LOWER CAMBER, 1/16" SHEET RIBS.
FUSELAGE CONSTRUCTION:
LONGERONS 1/8" SQ., CROSSBRACING 1/16" x 1/8", 1/16" DIA. WIRE RETRACTABLE L.G, RETURN GEARS.
RUDDER CONSTRUCTION:
1/8" SHEET BALSA
STAB CONSTRUCTION:
CLARK Y SECTION, L.E. 1/8" SQ., T.E. 3/32" x 3/8", 1/32" x 1 1/4" SHEETING ON UPPER CAMBER, 1/32" x 3/4" SHEETING ON LOWER CAMBER, 1/16" SHEET RIBS.
PROPELLER:
20.5" DIA. ONE BLADE FOLDER, 42.5 ACTUAL PITCH.
POWER:
14 STRANDS 1/4" DUNLOP 40" LONG, OR 16 STRANDS OF T-56 40" LONG. (TWO MOTORS) ESTIMATED MOTOR RUN OF TWO MINUTES ON 800 TURNS PER MOTOR.
WEIGHTS:
FUSELAGE___2.10
WING_____1.00
STAB_____.60
PROP._____1.10
RUBBER____6.20
10.90 OZ.
63¾"

THE "CONVENTIONAL" TYPE

tional design.

This design employs the same principles that enabled us to obtain close to a four-minute average with a Canard Wakefield under the old rules. With the modifications we have employed, it is easy to visualize how such a design might be capable of doing better than a 4½ minutes average under any conditions.

To many flyers the Wakefield is a relatively new field and because of this, there will naturally be a strong desire to utilize a more conventional type of configuration. We will not contest this point, but at the same time we strongly recommend that some definite improvements in design and construction be made, if consistency and higher average times are to be achieved.

The "conventional" design we have outlined, though outwardly similar to many others, incorporates desirable improvements. Significant features are large diameter, pitch and blade area propeller, high aspect ratio wing incorporating the Davis airfoil, moderately long fuselage with geared motors, and small stabilizing surfaces.

By increasing the aspect ratio of the wing we increase the relative span of the wing and the lateral stability of the model. This in effect assists us in maintaining better control of high torque, because of the added resistance of the model to displacement of the lateral axis.

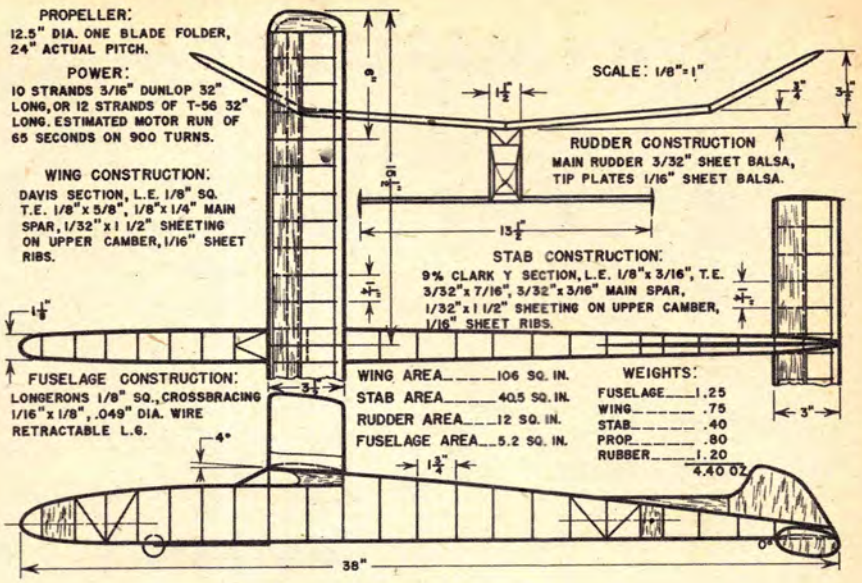
The Davis airfoil was prompted out of respect for its high lift to drag ratio which according to actual flight tests proved superior to the R.A.F. 32, Eiffel 400, Goettingen 431 and Clark Y—the selfsame airfoils that have been used on Wakefield designs for years!

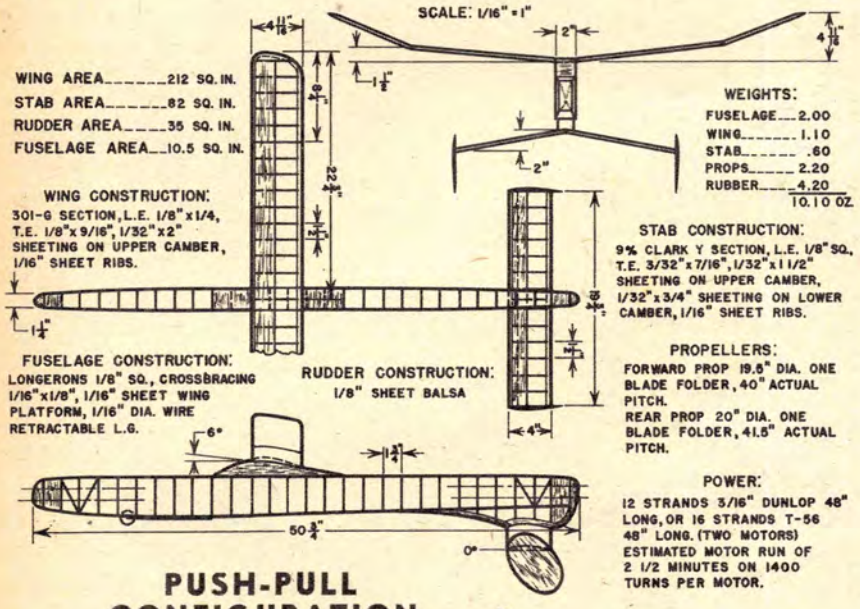
In using the long fuselage with return gears we had three important objectives in mind: long motor run, stability and small stabilizing surfaces.

The long motor run is achieved through the use of return gears rather than a single motor running the complete length of the fuselage. We obtain a forward position of the center of gravity, thus creating a long tail moment arm and achieve a higher degree of longitudinal stability while utilizing relatively small stabilizing surfaces.

Many model builders have expressed an (*Continued on page 65*)

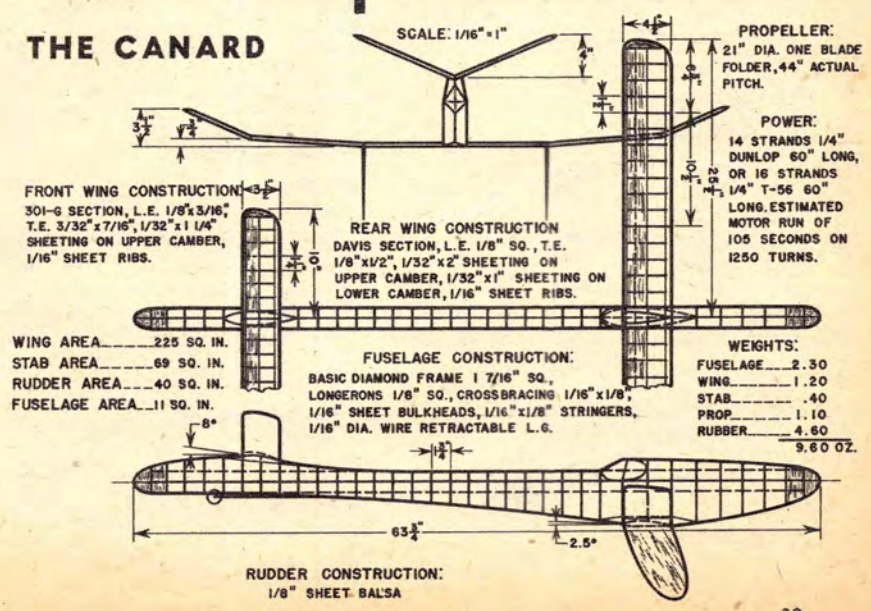
"HALF-A" WAKEFIELD


PROPELLER:
12.5" DIA. ONE BLADE FOLDER, 24" ACTUAL PITCH.
POWER:
10 STRANDS 3/16" DUNLOP 32" LONG, OR 12 STRANDS OF T-56 32" LONG. ESTIMATED MOTOR RUN OF 65 SECONDS ON 900 TURNS.
WING CONSTRUCTION:
DAVIS SECTION, L.E. 1/8" SQ. T.E. 1/8"x 5/8", 1/8"x 1/4" MAIN SPAR, 1/32"x 1 1/2" SHEETING ON UPPER CAMBER, 1/16" SHEET RIBS.
SCALE: 1/8"=1"
RUDDER CONSTRUCTION
MAIN RUDDER 3/32" SHEET BALSA, TIP PLATES 1/16" SHEET BALSA.
STAB CONSTRUCTION:
9% CLARK Y SECTION, L.E. 1/8"x 3/16", T.E. 3/32"x 7/16", 3/32"x 3/16" MAIN SPAR, 1/32"x 1 1/2" SHEETING ON UPPER CAMBER, 1/16" SHEET RIBS.
FUSELAGE CONSTRUCTION:
LONGERONS 1/8" SQ., CROSSBRACING 1/16"x 1/8", .049" DIA. WIRE RETRACTABLE L.G.
WING AREA 106 SQ. IN.
STAB AREA 40.5 SQ. IN.
RUDDER AREA 12 SQ. IN.
FUSELAGE AREA 5.2 SQ. IN.
WEIGHTS:
FUSELAGE 1.25
WING .75
STAB .40
PROP .80
RUBBER 1.20
4.40 OZ.
38"


SCALE: 1/16"=1"
WING AREA 212 SQ. IN.
STAB AREA 82 SQ. IN.
RUDDER AREA 35 SQ. IN.
FUSELAGE AREA 10.5 SQ. IN.
WING CONSTRUCTION:
301-G SECTION, L.E. 1/8"x 1/4", T.E. 1/8"x 9/16", 1/32"x 2" SHEETING ON UPPER CAMBER, 1/16" SHEET RIBS.
FUSELAGE CONSTRUCTION:
LONGERONS 1/8" SQ., CROSSBRACING 1/16"x 1/8", 1/16" SHEET WING PLATFORM, 1/16" DIA. WIRE RETRACTABLE L.G.
RUDDER CONSTRUCTION:
1/8" SHEET BALSA
WEIGHTS:
FUSELAGE 2.00
WING 1.10
STAB .60
PROPS 2.20
RUBBER 4.20
10.10 OZ.
STAB CONSTRUCTION:
9% CLARK Y SECTION, L.E. 1/8" SQ., T.E. 3/32"x 7/16", 1/32"x 1 1/2" SHEETING ON UPPER CAMBER, 1/32"x 3/4" SHEETING ON LOWER CAMBER, 1/16" SHEET RIBS.
PROPELLERS:
FORWARD PROP 19.5" DIA. ONE BLADE FOLDER, 40" ACTUAL PITCH.
REAR PROP 20" DIA. ONE BLADE FOLDER, 41.5" ACTUAL PITCH.
POWER:
12 STRANDS 3/16" DUNLOP 48" LONG, OR 16 STRANDS T-56 48" LONG. (TWO MOTORS) ESTIMATED MOTOR RUN OF 2 1/2 MINUTES ON 1400 TURNS PER MOTOR.
50¾"

PUSH-PULL CONFIGURATION

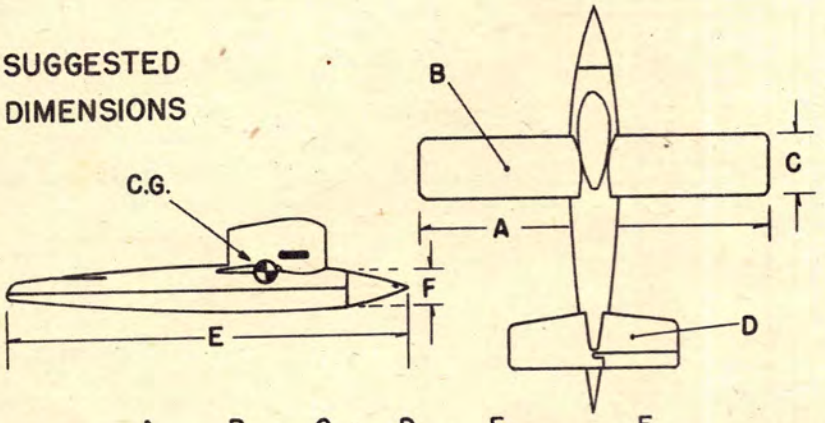
THE CANARD


SCALE: 1/16"=1"
PROPELLER:
21" DIA. ONE BLADE FOLDER, 44" ACTUAL PITCH.
POWER:
14 STRANDS 1/4" DUNLOP 60" LONG, OR 16 STRANDS 1/4" T-56 60" LONG. ESTIMATED MOTOR RUN OF 105 SECONDS ON 1250 TURNS.
FRONT WING CONSTRUCTION:
301-G SECTION, L.E. 1/8"x 3/16", T.E. 3/32"x 7/16", 1/32"x 1 1/4" SHEETING ON UPPER CAMBER, 1/16" SHEET RIBS.
REAR WING CONSTRUCTION
DAVIS SECTION, L.E. 1/8" SQ., T.E. 1/8"x 1/2", 1/32"x 2" SHEETING ON UPPER CAMBER, 1/32"x 1" SHEETING ON LOWER CAMBER, 1/16" SHEET RIBS.
WING AREA 225 SQ. IN.
STAB AREA 69 SQ. IN.
RUDDER AREA 40 SQ. IN.
FUSELAGE AREA 11 SQ. IN.
FUSELAGE CONSTRUCTION:
BASIC DIAMOND FRAME 1 7/16" SQ., LONGERONS 1/8" SQ., CROSSBRACING 1/16"x 1/8", 1/16" SHEET BULKHEADS, 1/16"x 1/8" STRINGERS, 1/16" DIA. WIRE RETRACTABLE L.G.
WEIGHTS:
FUSELAGE 2.30
WING 1.20
STAB .40
PROP 1.10
RUBBER 4.60
9.60 OZ.
63¾"
2.5°
RUDDER CONSTRUCTION:
1/8" SHEET BALSA

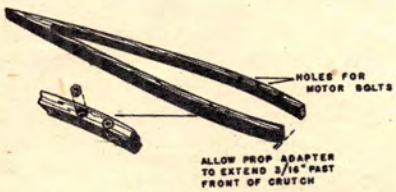
AIR-MODEL MANUAL

Elementary Modeling: Speed Stuff

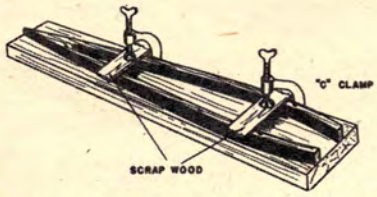
SUGGESTED DIMENSIONS



CLASS	A WING SPAN	B WING AREA	C WING CHORD	D TAIL AREA	E LENGTH OVERALL	F SPINNER DIA.	WEIGHT
D	20	60	3	22.5	22	1 3/4	28 OZ.
C	18	49	2 3/4	17	20	1 3/4	25 OZ.
B	15	34	2 1/4	14	17	1 1/2	15 OZ.
A	12	24	2	9	14	1	12 OZ.
1/2A	10	18	1 3/4	6.5	12	3/4	6 OZ.

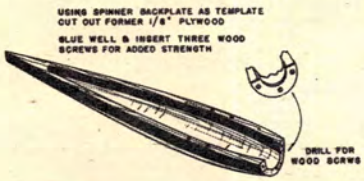


1—Begin by cutting crutch with coping saw. Use maple or equally hard wood. Set nuts for motor bolts in underside of crutch. Take your time, work slowly and carefully.



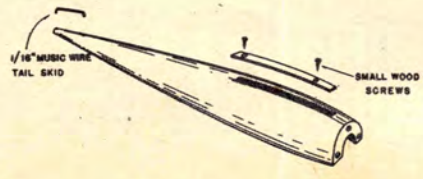
2—For bottom crutch fairing use rock-hard, straight-grain balsa. Glue well, clamp securely; set aside to dry thoroughly overnight.

3—Hollow out enough clearance for engine.

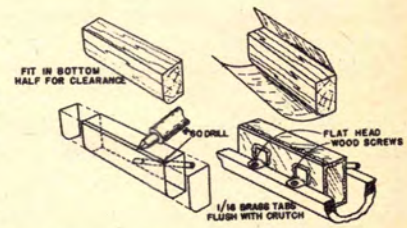

USING SPINNER BACKPLATE AS TEMPLATE CUT OUT FORMER 1/8" PLYWOOD
GLUE WELL & INSERT THREE WOOD SCREWS FOR ADDED STRENGTH
DRILL FOR WOOD SCREWS

4—Shape outline to desired contours; complete hollowing-out job, allowing about 3/16" wall thickness. Sand smooth both inside and outside. Make former as shown.

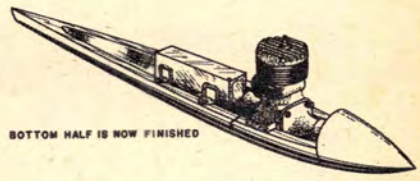
5—Cover entire shell inside and out with gauze bandage; leaving top of crutch open. Give 3 liberal coats of dope. Dry for 6 hours.



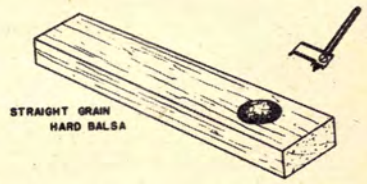
6—Belly skid of dural or hardened aluminum.



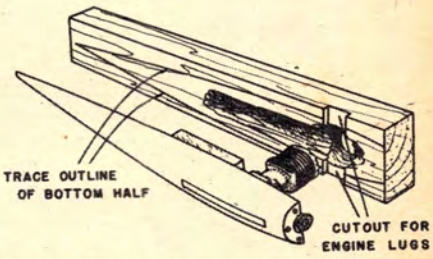
7—Make pine block shape of tank. Wrap block snugly with tincan stock (fuel can will do). Slip out block, solder seam well. Install pick-up tube one-half distance back on the bottom. Solder in place end plates.



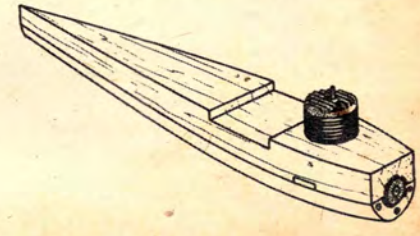
8—Mount engine. Fill exhaust, venturi openings with rags to protect engine from dust.



9—Top block hole is slightly larger than cylinder. Use extension drill or coping saw.



10—Hollow out just enough for tank, engine, so the top fits flush against bottom.



11—Shape top outline, notch out for wing.

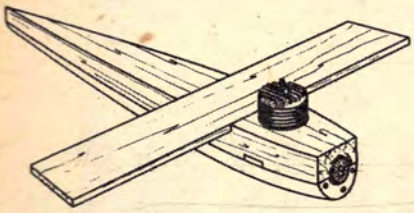
Many of the younger model builders, after graduating from simple stunt and sport planes of the slab type, find it difficult to turn out a well-constructed speed ship. The building problems are quite different from those found in built-up models.

This type of construction is not limited to the design illustrated here. Main building methods may be adapted to any design of the builder's choice. Employing wood exclusively, it is not beyond the abilities of even the inexperienced starter.

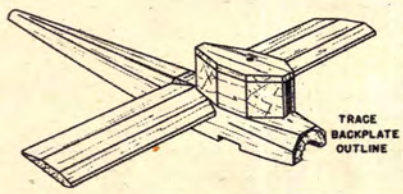
The most important point in using all-wood speed construction is securely-glued joints. Each connection should be triple coated with glue wherever possible.

If these ideas and suggestions are followed the builder will be rewarded with a light, durable plane limited only by the particular design used. One Class D speed ship built in this manner is still ready to go after 18 months of hard flying.

It is still possible to fly a good speed ship of your own design without being a machinist and a sheet metal expert. Try the suggestions shown here and see for yourself.

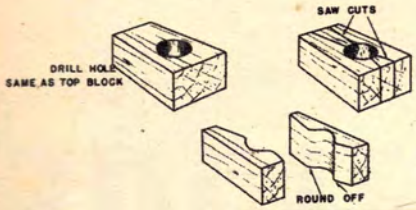


12—Glue in wing blank of hard balsa. Hold with three coats of glue, apply liberally.

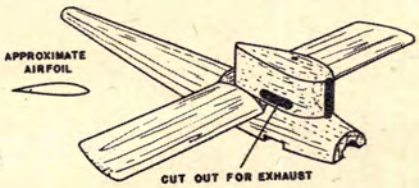


15—Then the top half, wing and cowl are each roughed out with saw and sanding block.

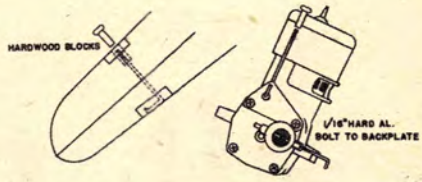
18—Cut slot in top half of fuselage, slide and glue stabilizer in place; install pushrod. Horn is 1/16 half hard aluminum, bind and glue well. Hinges are fabric; elevators have 20 deg. up and 10 deg. down movement.



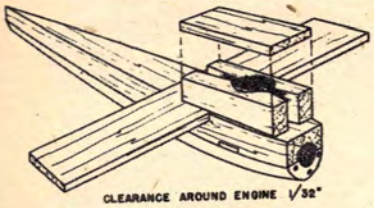
13—Next comes the construction of the cowl. Height is determined by engine you're using.



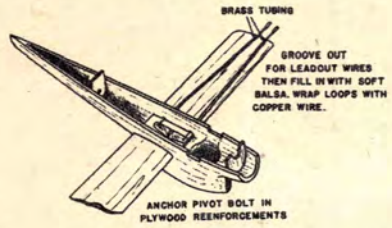
16—Finish to final contours with sanding block, first rough, then fine sandpaper.



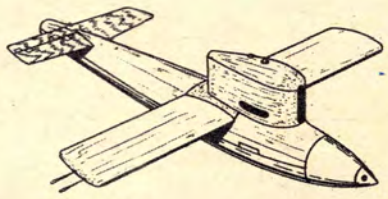
19—Front, rear hold-down bolts are bicycle spokes cut down, bent to shape. Note blocks.



14—Cowl sides are now glued to top half of fuselage, then the cowl top glued securely.

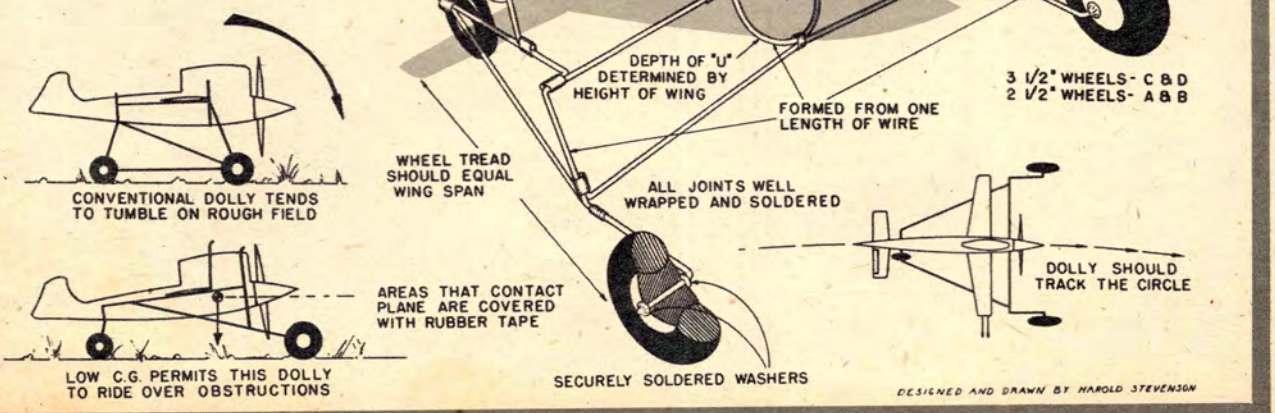

BRASS TUBING
GROOVE OUT FOR LEADOUT WIRES THEN FILL IN WITH SOFT BALSA. WRAP LOOPS WITH COPPER WIRE.
ANCHOR PIVOT BOLT IN PLYWOOD REENFORCEMENTS

17—Hollow top half, install bellcrank; 1/8" plywood formers fit tight into bottom half.



20—Model is now ready for finishing. Be sure and give inside-out thorough fuelproofing.

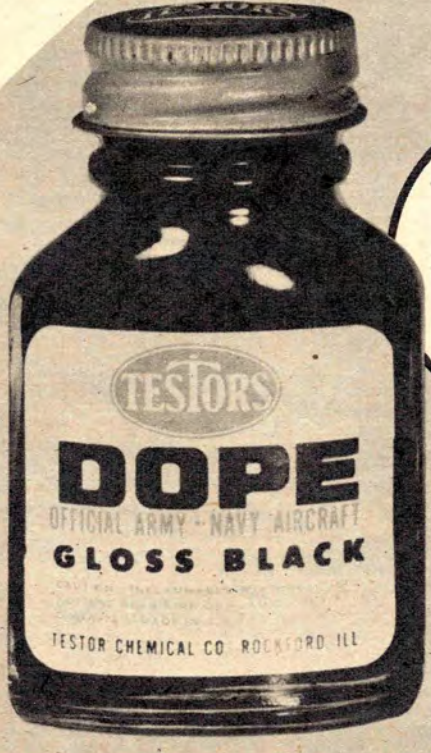
Fool Proof Speed Dolly


VERTICAL WING GUIDE
VERTICAL FUSELAGE GUIDE
CLASSES C & D 1/8" MUSIC WIRE
CLASSES A & B 3/32 MUSIC WIRE
DEPTH OF "U" DETERMINED BY HEIGHT OF WING
FORMED FROM ONE LENGTH OF WIRE
3 1/2" WHEELS- C & D
2 1/2" WHEELS- A & B
WHEEL TREAD SHOULD EQUAL WING SPAN
ALL JOINTS WELL WRAPPED AND SOLDERED
CONVENTIONAL DOLLY TENDS TO TUMBLE ON ROUGH FIELD
AREAS THAT CONTACT PLANE ARE COVERED WITH RUBBER TAPE
DOLLY SHOULD TRACK THE CIRCLE
LOW C.G. PERMITS THIS DOLLY TO RIDE OVER OBSTRUCTIONS
SECURELY SOLDERED WASHERS
DESIGNED AND DRAWN BY HAROLD STEVENSON

TESTORS DOPE

on the market...a

all other brands



15¢

...Costs extra qu

- One-Coa (HIGH H
- Easy Bru
- Excellen

TESTOR CHEMICA

E...largest seller

actually outsells

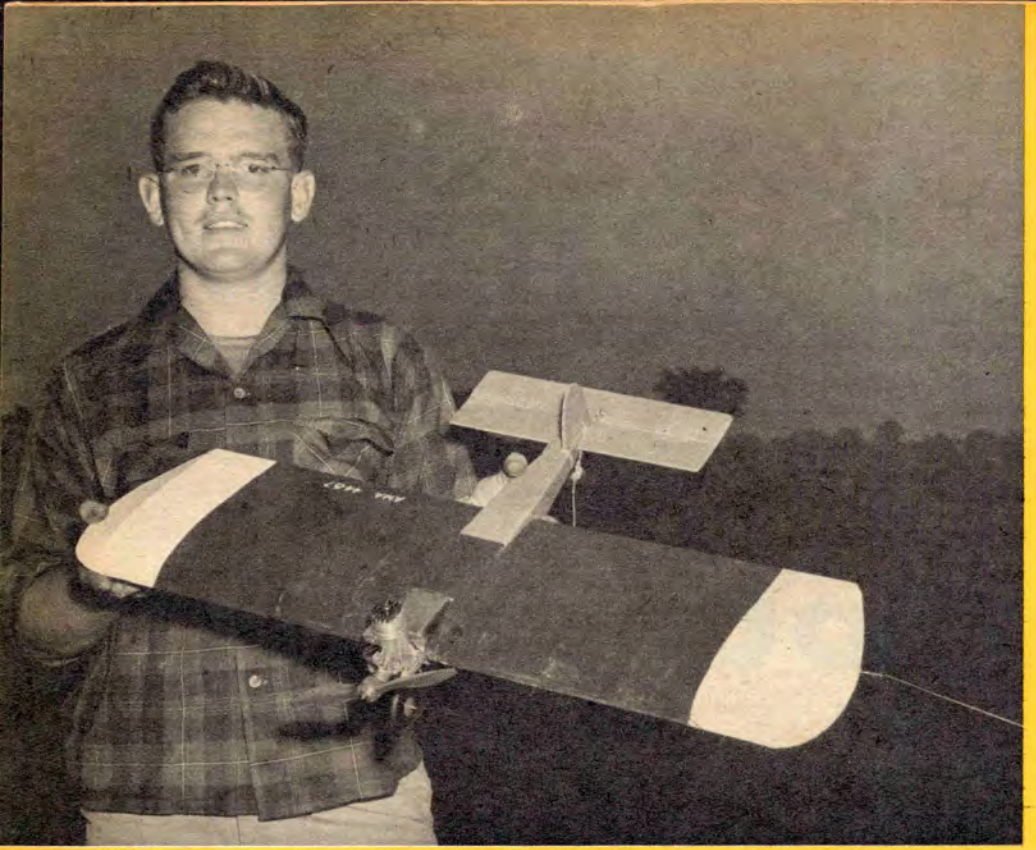
s combined...

s a little more, but the
quality is well worth the extra pennies

Coat Coverage
GH HIDING POWER)
Brushing or Spraying
lent Rubbing Qualities

- High Flexibility
- Film Toughness
- Pure Color Brilliance

AL COMPANY • ROCKFORD, ILLINOIS



George M. Aldrich, 19 (above), Texas stunt flyer, captured International honors at the Detroit Plymouth meet. One ship he flew, the Combateer, attracted much favorable attention. Model was designed by M. L. Huiet and Harry R. Young, both 27 and both of Houston. Each was in the Navy for 4 years and did considerable big-plane piloting.

Designed by
HARRY R. YOUNG
and M. L. HUIET
and flown by
GEORGE M. ALDRICH
Intern't'al Stunt Champ

Plans by
Aubrey Kochman

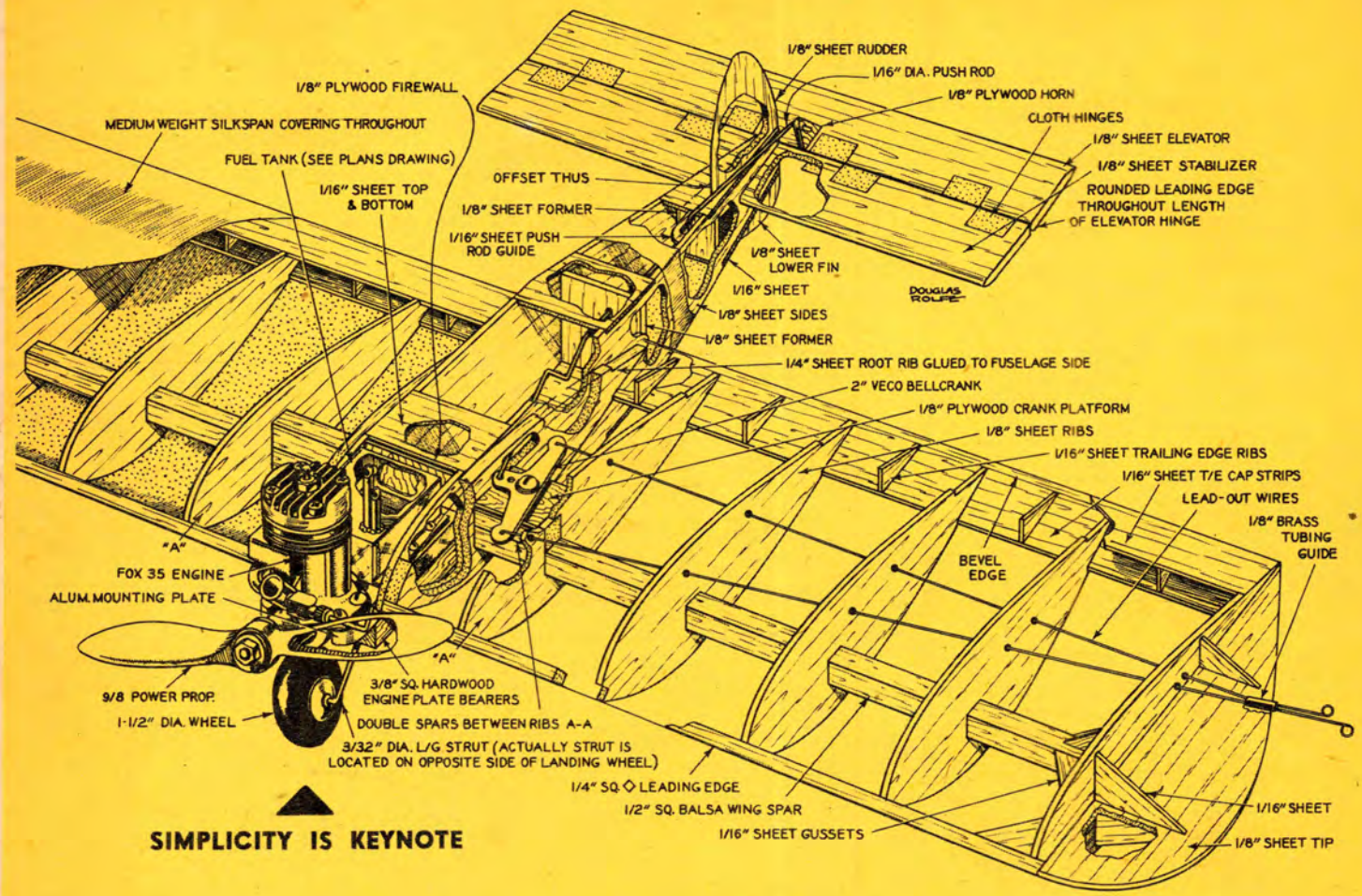
Cutaway Drawings by
Douglas Rolfe

Combateer

■ This model is the thirtieth of a series built in a joint effort to find the perfect combat plane. On planes prior to this, we tried every size, but none was successful for both speed and maneuverability. We also tried many types of structures. It was decided that the most easily built and the least expensive was most suitable because of the short life of a combat plane.

After a crack-up, many parts of this plane can be re-used on another. It has a speed of over 80 mph with a 9/8 Power Prop. It will also fly a full A.M.A. stunt pattern, making it double for a stunt trainer. The ship has placed first or second in every contest in which it has been flown by the authors. For flyers who may fear combat flying is more work than fun, the plane can be built on an easily constructed jig. Whether it is made on a jig or not, the cost will be around three dollars and the building time is not more than eight hours.

An important feature is the interchangeable power unit for using one



SIMPLICITY IS KEYNOTE

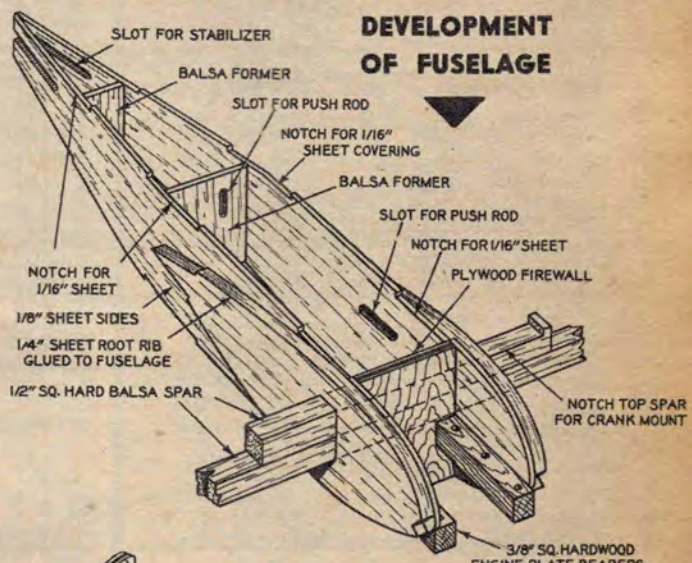
From out of Texas comes this outstanding design to score countless "combat" event victories

engine and fuel tank with several planes. In the event of a crack-up you can have another plane flying in five minutes using the same power unit. In some sections of the country this feature might not be considered important, but in Texas we fly combat until one flyer cuts the other's streamer, regardless of how many planes you must use. No judge is required to decide who is the winner—just measure the remaining streamers.

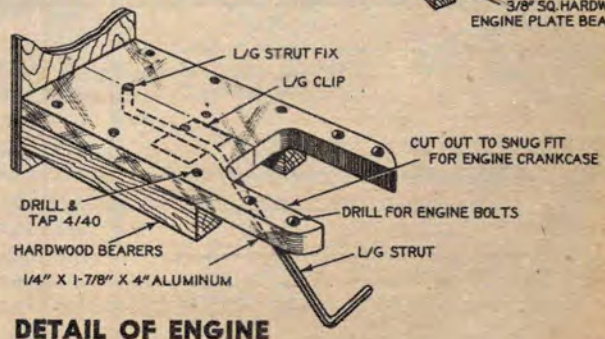
Another feature is the plane's ability to stay at the end of the lines. Upwind loops in a stiff breeze are possible. This is due to a large wingtip weight and the fact that the lead-out lines run through the same wingtip guide. The lines also run rearward at a slight angle, through the wing to follow the arc that the control lines take on during flight. This keeps the control lines from pulling the ship to the center of the circle.

The engine, fuel tank and landing gear are mounted on an aluminum plate. This plate is fastened to the plane by three 4-40 brass bolts, which pass through the plywood motor mount into 4-40 threaded holes tapped into the aluminum plate. Simple hand tools, a No. 43 drill and a 4-40 tap, are all you need to construct this plate. The material is aluminum which measures 1⅞" x ¼" x 4".

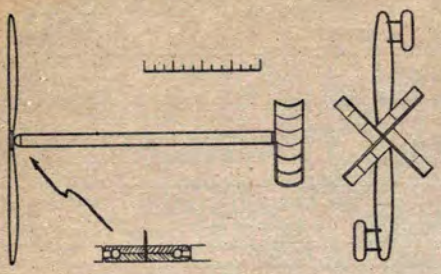
Cut clearance hole for the engine crankcase a bit under size and dress with a file until you have a snug fit. Mark, drill and tap 4-40 holes for the motor bolts. Make certain that if there is any offset in the engine, it is to the outside and not more than 3 degrees. Build the tank of .010 brass shim stock or a piece of tin can. Make sure that the solder joint between (*Continued on page 56*)


SLOT FOR STABILIZER
BALSA FORMER
SLOT FOR PUSH ROD
NOTCH FOR 1/16" SHEET COVERING
BALSA FORMER
SLOT FOR PUSH ROD
NOTCH FOR 1/16" SHEET
PLYWOOD FIREWALL
NOTCH FOR 1/16" SHEET
1/8" SHEET SIDES
1/4" SHEET ROOT RIB GLUED TO FUSELAGE
1/2" SQ. HARD BALSA SPAR
NOTCH TOP SPAR FOR CRANK MOUNT
3/8" SQ. HARDWOOD ENGINE PLATE BEARERS

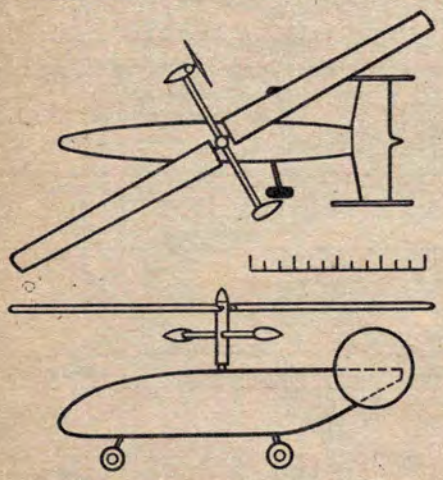
DEVELOPMENT OF FUSELAGE



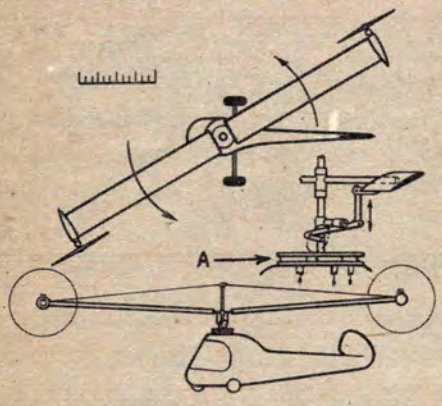
DETAIL OF ENGINE MOUNT PLATE



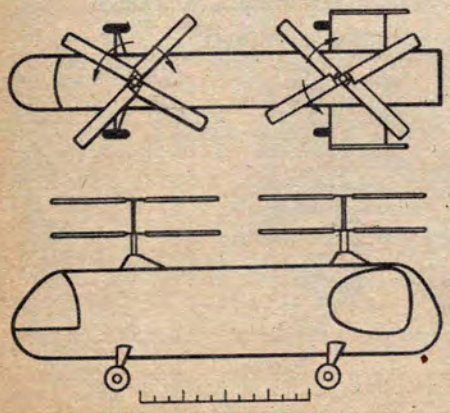
Rubber-powered entry by Luigi Bovo, Genoa, Italy. Larger prop built-up, paper-covered, has high-lift section and stabilizing vanes; blades free to pivot on longitudinal axis.



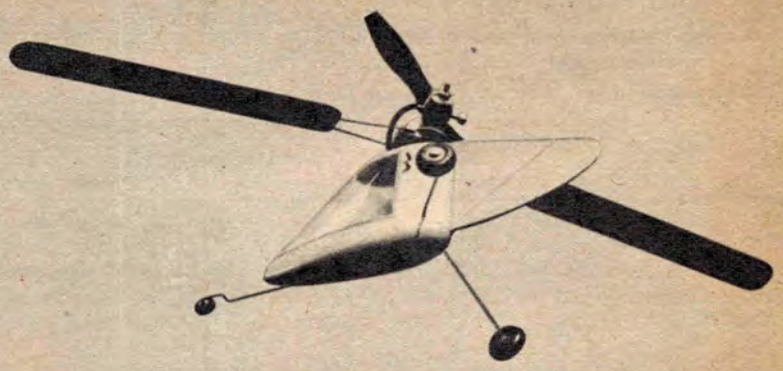
From far-off Linkoping, Sweden, C. G. Ahremark sends this one or two Half-A engine powered job. Blade span 34 in. Changing angle of attack by 30 deg. offset hinge.



Novel captive twin Half-A by J. F. Streinz and Dick Morenus. Pneumatic control utilizes "plate lifter" joke device inflating small balloons (A) under rotor wheel for direction.



Freight 'copter uses 4 CO_2 engines driving props through complicated pulley arrangement. Gas capsules located over C.G. Robert M. Johnson (Auburn, Cal.) submitted.



AIR-MODEL DESIGN COMPETITION

The HELICOPTER

Lively interest shown in 'copter design contest indicates modelers are

■ When a super Half-A engine is screaming its head off at 17,000 rpm it may be developing near one-tenth hp. Assuming 100 per cent theoretical efficiency, this power is able to pick up an 8 oz. weight and lift it 110 feet in one second, or 6,600 feet in one minute.

Having so much power in such a small and light package, one wonders why we do not have model helicopters buzzing everywhere since neighborhood horizontal flying space is scarce. Well, if power was all that was needed for success in helicopter flying, we would have seen full-scale helicopters much sooner, and the ones that we see now would have much more spectacular performance.

The number of entries in AT's helicopter design event was surprisingly high. Designs varied from practical to imaginative. That submitted by Paul H. Stahlhuth of Speedway, Ind., appeared to have the best flight possibilities. He has had past experience with such models as can be seen from details incorporated in the design.

In examining the plan, you will note how many problems were met in a clever way. To handle torque, Mr. Stahlhuth fixed pivoted vanes directly to motor and permits the unit to rotate. He has a contra-rotating system with a minimum of fuss. To provide steady fuel supply without changing balance, he used a fixed tank and transfers fuel through a hollow bearing shaft. His bearing layout is on the substantial side and designed to eliminate as much friction as possible. This all worked splendidly on test model.

The major item on this design is motor base to which practically all parts are fixed or mounted. You may have trouble duplicating it if you do not have a lathe. However, in such case it would pay to have it made outside as it can be used and re-used for years.

The model AT tested is identical to that shown with the exception that we used flat vanes instead of having pitch vary 10 deg. as recommended.

The model was first tested indoor. It was held stationary just to determine how well the rotor system worked. The upward pull proved more than strong enough to lift model. Holding fuselage portion while contra-rotating rotors were turning produced no particular torque reaction. The bearing and fuel supply functioned fine. During outdoor testing, model would take off from ground by itself and start upward with a strong and fast vertical ascent. It was fun just watching it do its realistic and unassisted take-offs—and were they fast!

The only change suggested is enlargement of vanes. The model should be slowed up, and larger vanes should do the trick. Double the area shown on plans. The .049 wire which is used as hinge for vanes was found to be some what weak. It did not break but made blades too flexi-

experimenting with this challenging category

ble, so use heavier size. If you plan to use still larger vanes, consider built-up construction to keep gyroscopic action as low as possible. On the whole, the design as shown is a good base on which to start your helicopter experiments. The prop should be 6" dia. and 2" pitch.

Start construction by cutting upper and lower plywood bases. To lower base fix landing gear. Landing gear is held in place with thread and cement. Cement balsa fairing and carve to shape. When making upper base, it might be well to start with hole and then cut outline. This will center the hole which should be smaller than bushing to provide a forced fit. After bushing has been forced through plywood, cover base with balsa fairing. The bushing hole in this fairing should also be smaller to provide a forced fit. Carve and shape top with bushing in place. Make sure it is perpendicular. Dope and fuel proof this upper portion at this point. If you try to do it later on you may foul the bearing.

Assemble motor base plate and fuselage top. Be sure nut is tight so it will not work loose. You can spread the threads a bit for locking. If job is done well, the motor base should rotate freely.

After cutting the ⅛" balsa bulkhead you are ready to assemble. Use front strip to obtain equal spacing between top and bottom. Let assembly dry well before going further. Be sure to place fuel tube into tank before assembling top and bottom.

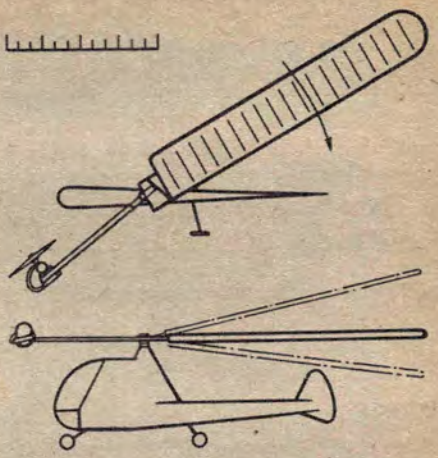
Next job is to position tank, so that fuel extension tube will not touch the eyelet. This has to be done carefully. Otherwise, tube may rub and bind in eyelet while motor is running. The eyelet has a "slop" fit but this should not be excessive or fuel may slosh out. The air vent and filling tubes should be below top of tank to prevent overflow through the eyelet.

After tank is positioned and cemented well, add fin. This will provide still more bracing for tank. Add balsa fairing around tank. Fuel proof area around tank thoroughly before closing it up with fairings.

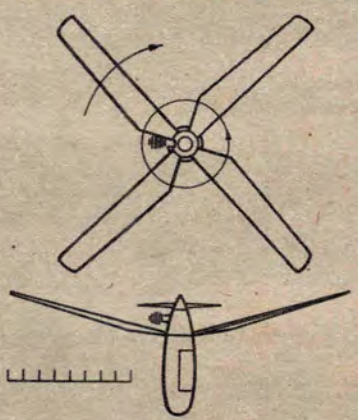
Finish as you like. Add celluloid cabin closure last. Make the first set of vanes without any "twist," and try other types later. They can be easily removed. By using heavier wire you will be able to change pitch to see what happens. For counterbalancing engine, we used solder wire for ease in finding balance point.

To start engine, hold fuselage and vanes in left hand and snap prop with the right. After engine is running release vanes and hold the fuselage. The vanes build up their revolutions gradually so there is no danger of being clipped.

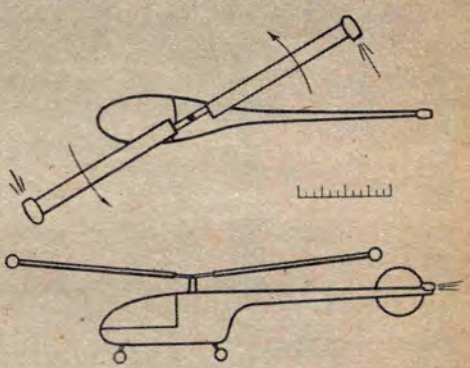
Although we may not be able to guarantee a perfected helicopter, we do feel that it is a good fundamental design on which you try your own ideas, such as larger vanes, more than two, and so on.



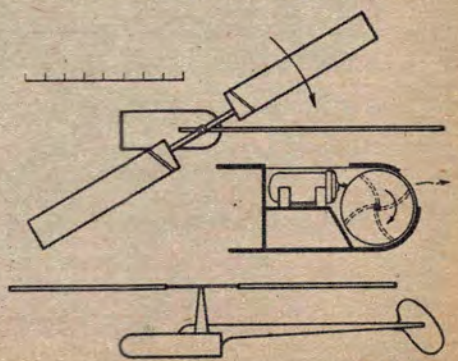
24 in. long rotor blade is powered by Half-A on 9⅝" boom. Blade autorotates by neg. incidence angle formed by 60 deg. offset hinge. A. E. Little, W. Newton, Mass.



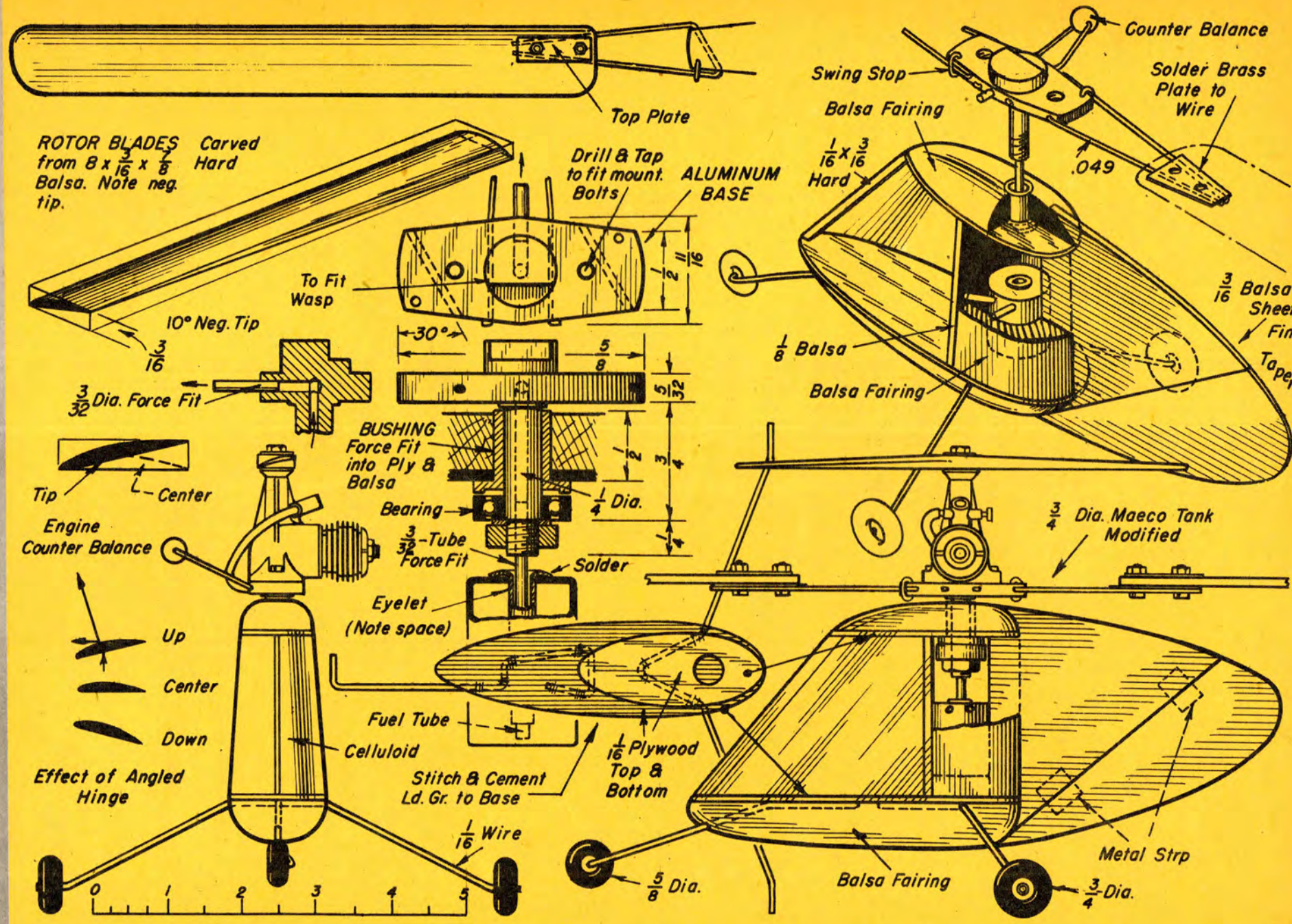
A. A. Faranda, Yonkers, N. Y., has 4-bladed 'copter with blades turning opposite to Half-A engine's prop. Perhaps end plates needed on rotors, he sez. 10 deg. dihedral.



Private type design by Jerry Cowan, Auburn, Calif., utilizes twin Jetex #200 powerplants with Jetex #50 in tail. However, Jerry did not cover changing blade angle of attack.



Novel idea from Bob Buragas, E. Orange, N. J.: Jetex #50 drives turbine blades which turn blades 8 in. long. Rear right side of pod open for exhaust, torque correction.


Top Plate
ROTOR BLADES Carved from 8 x 3/16 x 7/8 Hard Balsa. Note neg. tip.
10° Neg. Tip
3/16
Drill & Tap to fit mount. Bolts
ALUMINUM BASE
To Fit Wasp
1/2
11/16
30°
5/8
5/32
3/32 Dia. Force Fit
BUSHING Force Fit into Ply & Balsa
1/2
3/4
1/4 Dia.
Tip
Center
Bearing
Engine Counter Balance
3/32-Tube Force Fit
Solder
Eyelet (Note space)
Up
Center
Down
Effect of Angled Hinge
Fuel Tube
Celluloid
Stitch & Cement Ld. Gr. to Base
1/16 Plywood Top & Bottom
1/16 Wire
0 1 2 3 4 5
5/8 Dia.
Counter Balance
Swing Stop
Solder Brass Plate to Wire
Balsa Fairing
1/16 X 3/16 Hard
.049
3/16 Balsa Sheet Fin Taper
1/8 Balsa
Balsa Fairing
3/4 Dia. Maeco Tank Modified
Metal Strp
Balsa Fairing
3/4 Dia.

CMEC's Guided Star

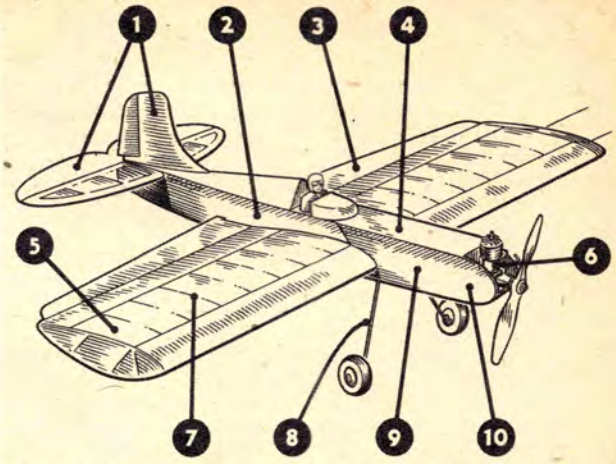
■ Guided Star, new stunt ship by Consolidated Model Engineering Co., New York 56, N. Y., of simplified modern appearance, is able to do all tricks. This old-time concern, which has in the last year or two been noted chiefly for Hell Razor speedsters and scale kits, thus returns to a field in which it was so successful several years back—remember the Super Cinch and Baby Cinch?

Intended for engines up to .35 cu. in., the Star will do a fine job on engines as small as Torp .19. Span is 40", chord is constant 10½", airfoil is thick, symmetrical. Simple box fuselage with four full-length 3/32" balsa sheets. Assembly is simple with tab and slot system. Four formers of rugged mahogany 3-ply have tabs that fit slots in fuselage sheets, providing sure alignment while cement dries. Fuselage balsa and ply parts are die cut.

Fuselage nose is strengthened by mahogany veneer side plates. Motor mounting can be made on the forward bulkhead, or lug-style engines can be fastened to the hardwood motor bearers. Cockpit is not cut out, but there is a turtle deck, and a cockpit forward block to add realism.

There are 22 wing ribs; they are stacked in threes on each side of fuselage for strength. Wing is light but strong; there are only two spars of ¼" sq. stock, but wing is covered with sheet balsa on top and bottom, at both leading and trailing edges. Half the surface is sheet-covered, the rest papered.

Center area of wing is strengthened by filler blocks and plywood spar joiners, and, naturally, by the fact that it can be firmly cemented to the fuselage. Tip shape is provided by ready-cut 3/16" balsa plates. After the wing is completely assembled to the fuselage, large fixed balsa flaps are added to the trailing edges. Fuselage slots assure proper positioning of these flaps.



1. Die-cut tail surfaces. 2. Die-cut sides, top, bottom. 3. Die-cut stationary flaps. 4. Die-cut plywood formers. 5. Silkspan wing covering. 6. .29 to .35 engine recommended. 7. Die-cut wing ribs. 8. Formed steel wire landing gear. 9. Mahogany veneer side stiffeners. 10. Hardwood engine bearers.

Tail surfaces are ready-shaped from ¼" balsa, so they can be finished to a nice streamline cross-section. Because this wood is a lightweight grade there is no excess weight at the tail.

Designers find an average modeler can assemble kit in about five hours; beginner will take about 10. Original test ship weighed 20 oz. with Torp .19; it used a 9/4 Tornado prop. Beefed-up and fitted with a Torp .32, ship weighed 28 oz.

Sterling's Chris-Craft

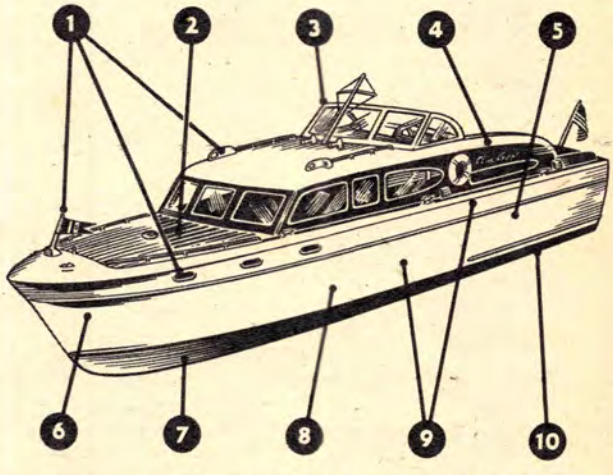
■ Sterling Models of Philadelphia some time ago turned their attention and knowledge to the boat field to bring out two models of power boats. These have been so popular that an even more complete kit was demanded; the result is the Chris-Craft Buccaneer, for actual running or for decoration.

Construction follows closely that worked out for the earlier boats. The hull is built up upon a solid, shaped balsa bottom piece, which insures that there will be no twist in the finished boat. Die-cut bulkheads fit into slots in this bottom piece, other hull parts are added with ease, since it is a rugged foundation. Complete prefabrication makes it virtually a sure thing that even the novice can complete assembly without any headaches.

The boat is designed for power running, if desired. The smaller OK Cubs will fit nicely, and are fastened to a plywood bulkhead running the full width of the cabin. The engine will be well below decks to keep the C. G. low for stability. For more sedate power running, a small electric motor and a pair of flashlight cells are the answer. Kit includes shaft, stuffing box, propeller, and other needed drive parts.

Most of the deck and superstructure is constructed of die-cut mahogany. The cabin may be made removable if gas engine power is fitted. It is built upon the finished hull to assure a perfect fit. If you want the ship only as an exhibition or shelf model, the cabin may be cemented in place after the interior furnishings have been fitted.

Most of the fittings are die-cast and the larger ones, such as the two life preservers, are fully detailed. Included are vents, steering wheel, lights, air horns, chocks and cleats, and many other authentic nautical essentials. There is plenty of celluloid for the many windows, and a cut shaped and colored piece of the same for the Flying Bridge windshield. Scale twin die-cast props are provided for the shelf-model builder.



1. Numerous die-cast metallic scale parts. 2. Die-cut mahogany decking, paneling. 3. Die-cut shaped, painted wind screen. 4. Die-cut mahogany sides, transom, parts. 5. Die-cut side sheets. 6. Pre-cut planking strips. 7. Shaped, notched and grooved lower hull. 8. Provisions for A/2 or mini-electric motor. 9. Die-cut bulkheads, sheer pieces. 10. Shafting, coupling, propeller for powerplant.

The large plan sheet carries full-size top and side views, a detailed interior drawing and photos of the big Buccaneer, plus many isometric assembly drawings, and extremely complete building, painting and finishing instructions.

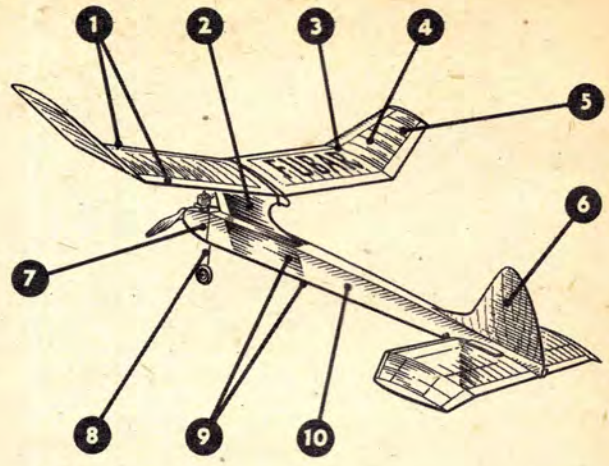
Midwest's Fu-Bar

■ A product of Midwest Model Aircraft Co., Chicago 36, Ill., the original Fu-Bar kit was the 36" Half-A job that racked up many contest wins this past season. The "65", like the earlier plane a product of the design skill of Ray Matthews, has proven its capabilities. A total of seven places, 5th or better, went to Fu-Bars in various classes at the '51 Nats.

There is a powerful lot of wood in this kit; 14 sheets of die-cut balsa parts, and two more of plywood—and that's just the beginning! The fuselage sides are beautiful full-length strips of "C cut" balsa; that is, the cut which is most resistant to bending. You'll start off, therefore, with a light but twist-resistant foundation. All the die cut sheets have every individual part numbered—just check the drawings, ascertain the number required, and pull it out of its sheet. Since the fuselage contains 12 balsa formers, and each wing half has 17 ribs, this is a real convenience.

The forward fuselage former is a heavy 5-ply piece which supports the single-leg landing gear, and forms the front brace for the wing pylon. Hardwood beams are supplied for lug-style motor mounting, but parts are also supplied for radial mounting. After the side pieces and formers are assembled, the fuselage is finished off with pylon installation and balsa top and bottom covering.

The wing is built up. The main plan sheet gives full size views of the entire wing, the fuselage, and stabilizer. It should be used as a guide by building the wing halves directly over it, using waxed paper between. The wing has three spars, plus the leading edge, and a wide ready-shaped trailing edge. The nose area is planked after all dihedral joints have been made.



1. Shaped leading, trailing edges. 2. Die-cut pylon parts. 3. Die-cut plywood wing joiners. 4. Die-cut wing, stabilizer ribs. 5. Silkspan wing stabilizer covering. 6. Die-cut fin. 7. Shaped firewall (optional radial-beam mounting). 8. Formed gear strut. 9. Shaped fuselage sides, bottom. 10. Die-cut formers.

Stab construction is very similar to that of the wing, but stab tips turn down, acting as twin tail skids. There is no planking on stab; rudder is sheet balsa.

Instruction sheet drawings, produced by old-timer Ed Lidgard, give the necessary data on rigging the ship, and on flying. A swinging wing tab is recommended, and should be installed after glide tests have been completed. It is weighted with clay until the ship shows the proper amount of left turn in the glide.

With an average .29 engine, completed weight will run from 29 to 33 oz. Recommended engine range is .29-.35.

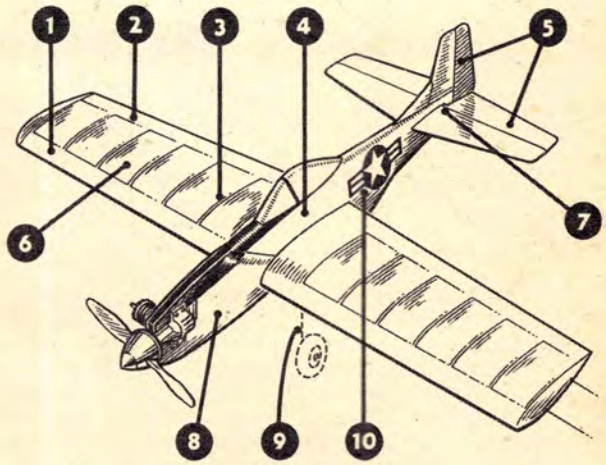
PDQ's Mustang

■ Combat flying is growing fast and seems destined to become an official event in many contests this coming season. So far, most flyers simply adapt their stunt ships for this exciting new competition, but this is not the real answer. While the rules make it a misdemeanor to cut off your opponent's rudder, or chew his fuselage in half, such accidents can, and often do, happen. It appears that a ship of simple, yet rugged, construction, which can be repaired right at the field may be the best bet.

Just such a job is offered to the builder by PDQ Products Co., Philadelphia, Pa. Not only is this model designed especially for combat; but it has the appearance of the famed F-51 Mustang to give it eye appeal. Following the theme of rugged simplicity, a profile fuselage of 9/16" thick solid balsa is employed. (Let's see your opponent cut *that!*)

The bubble canopy and bulging underslung radiator of the Mustang are simulated by balsa blocks, another factor making for durability. The fuselage nose is strengthened by side plates of a tough material called Tekwood, which appears to have a wood center with hard cardboard glued on each side. All parts of the kit, including the Tekwood, are cut to shape. The builder will have little balsa-butchering to do, except for rounding the fuselage and wing tip edges.

Tail surfaces are die-cut, as are the wing ribs. Wing is tapered in the true Mustang tradition, and has a thick symmetrical section. The leading and trailing edges are fully shaped, and notched for ribs. Wing covering paper is included. A Tekwood plate is furnished for the control mounting, while the elevator horn is die-cut 3-ply. The bellcrank is mounted on the inboard side of the wing to do away with need for a wing tip weight.



1. Notched, shaped leading edge. 2. Notched, tapered trailing edge. 3. Die-cut wing ribs. 4. Die-cut profile fuselage. 5. Die-cut tail group parts. 6. Silkspan wing covering. 7. Wire and plywood control parts. 8. Die-cut "Tekwood" fuselage reinforcements. 9. Shaped optional landing gear leg struts. 10. Decal insignia.

Extensive tests have shown the P-51 will hit about 75 mph when fitted with a Torp .29 and 9/8 or 10/6 Top Flite prop. With a Fox .35 and 10/6 prop, speeds of 80-90 mph were obtained.

The engine is side mounted, which heightens the scale appearance, and hardwood bearers are used. If a washer is used between front motor lugs and bearers, no rudder offset will be required. The high thrust line makes it possible to use a large fuel tank.

The finished ship has a 36" span, 25" length, and weighs around 20 oz. It is intended for .23-.49 engines.

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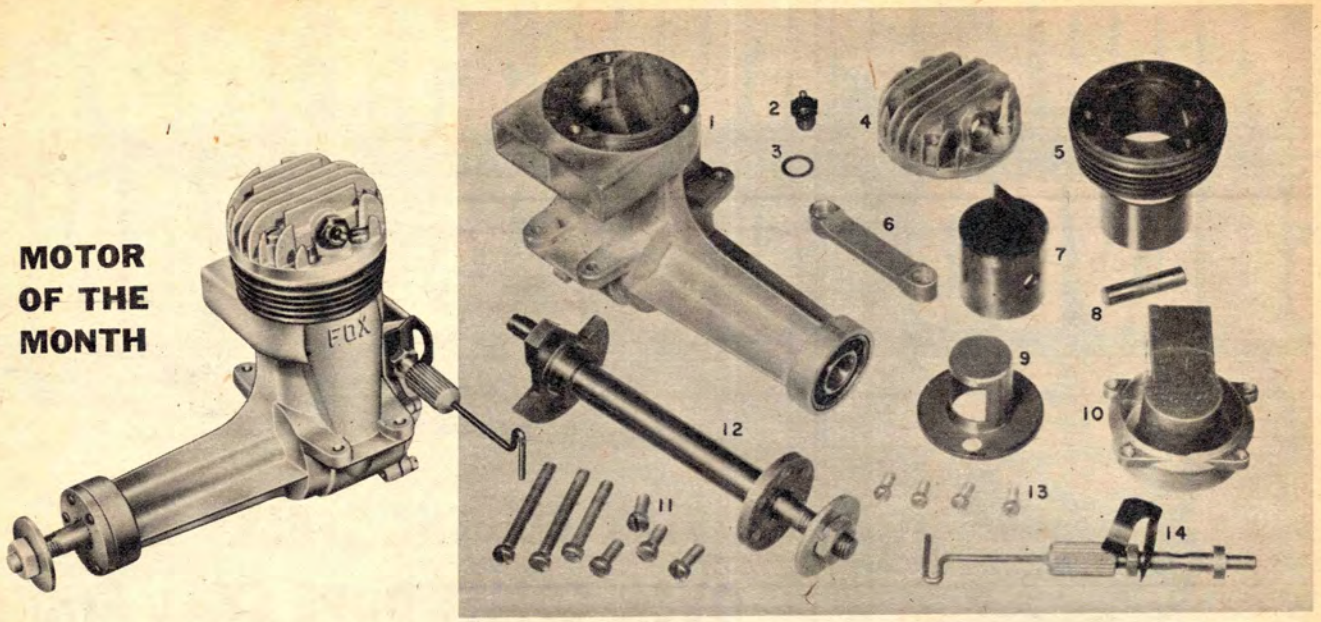
MOTOR OF THE MONTH



FOX 59

The "big boy" in Fox line of powerplants is a special job designed for real performance with stunt model aircraft

■ The Fox .59 has been designed to be a top-notch stunt engine. Outstanding workmanship plus many radical features result in a somewhat higher priced engine; but for the modeler who really wants something extra, here you get value for the money. The design features a new carburetion system that eliminates sputtering, and a cast-iron piston replaces the former aluminum piston on the stunt powerplant.

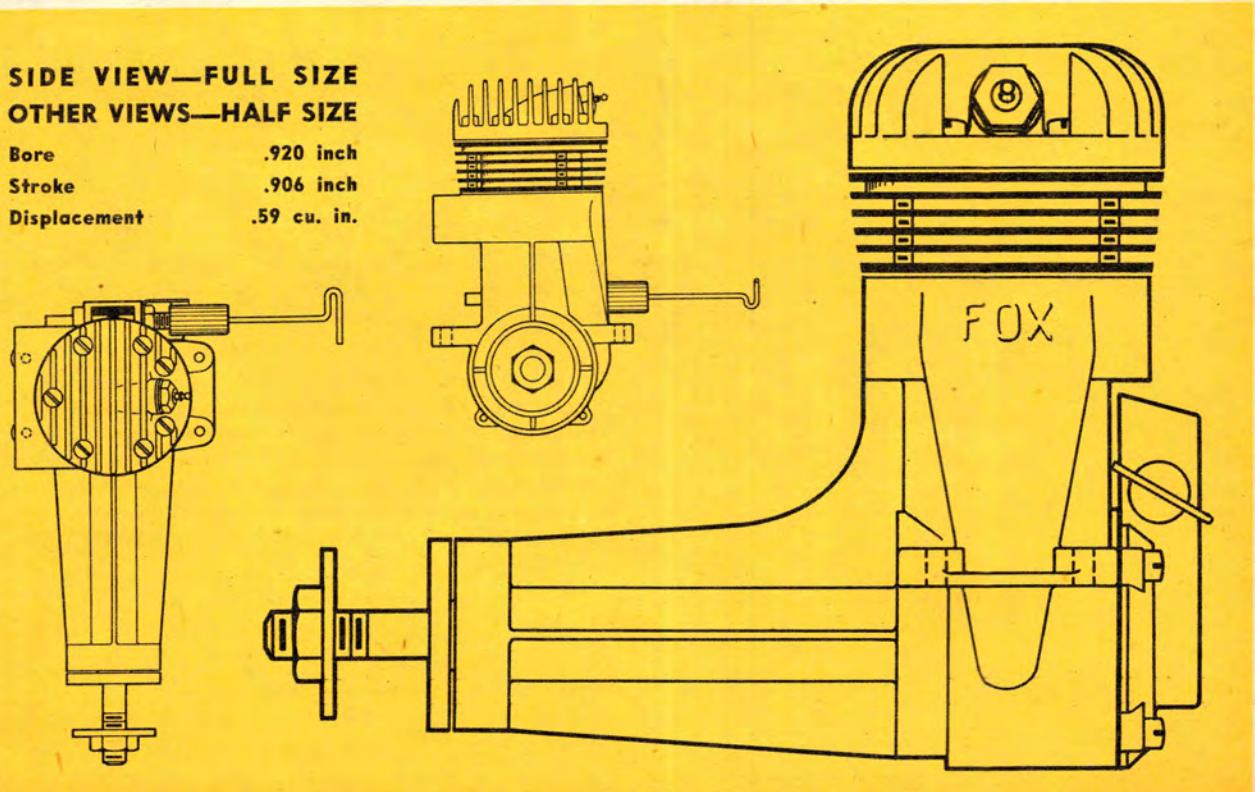
Among the many features the most obvious is the long extension shaft which, combined with the short overall height, makes it possible to do a clean job of cowling. Inside the engine a featherweight meehanite piston with a high straight baffle is used to get better pulling power. The cylinder head has a high dome inside similar to a racing engine and generous cooling fins on the top.

The glow plug is mounted on one side of the head, entering the combustion chamber at the top of the piston baffle. The rear downdraft carburetor is very uncommon on model engines but makes an excellent arrangement for installing the fuel tank close to the needle valve for better stunt performance.

The (*Continued on page 59*)

SIDE VIEW—FULL SIZE
OTHER VIEWS—HALF SIZE

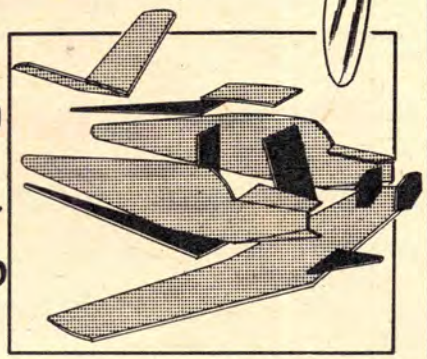
Bore	**.920 inch**
Stroke	**.906 inch**
Displacement	**.59 cu. in.**



18 MIN. FROM KIT TO 1st FLIGHT!

Cleveland's "Quicky" BONANZA

59¢ ea.



Only 12 separate balsa parts to cement together! It's the most easily built scale job you've ever flown!

QUICKY SETS ARE THE MOST SIMPLE, THE MOST REAL, AND THE BEST FLYERS OF THEIR KIND

Remember these "Quicky" facts! They are engineered to fly several hundred feet. **They can be assembled in an hour on your first try, and have actually been put together in 18 minutes** — There is no cutting, no tissue covering, and no painting to do, you merely assemble, then fly them — All of their few parts (only 13 to 21 parts) are predecorated, diecut, and each one interlocks with the next, so that a snappily finished model grows into shape before your eyes, even if you've never built a model in your life. Just compare the superior job of predecorating we've done, with any others! (all Quicky sets except jets now include rubber). All you need is a batch of Cleveland "Quicky" sets (get them all — you won't regret it) and a tube of cement.

STILL MANY GREAT BUILT-UP, PRINTED BALSA DESIGNS FOR THOSE WHO WANT TO PUT REAL CRAFTSMANSHIP INTO THEIR MODEL BUILDING!

30" P-40 WARHAWK $1.50
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30" GLOBE SWIFT $1.25
30" ERCOUPE $1.25
30" F-80 SHOOTING STAR $1.50
SPAD XIII Span 19" $1.75
24" F-51 MUSTANG $1.50
30" STINSON VOYAGER $1.25
FOKKER D-7 Span 17¼" $1.75
LUSCOMBE SEDAN Free-Flight-Control-Radio Giant 76" Span $7.50
36" F-61 BLACK WIDOW $2.25
LUSCOMBE SILVAIRE 43" Span $3.00
STINSON Flying Station Wagon 43" $5.50
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NEW!

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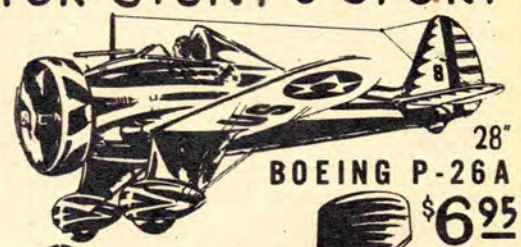
1" SCALE PREFABS FOR STUNT & SPORT



28" BOEING P-26A $6.95

27" GREAT LAKES TRAINER $5.95

BUILD THESE, AND BE PROUD OF THEM!

• Almost one sq. ft. of decals in P-26A! • Shaped, notched leading edges • Tapered, notched trailing edges • Preformed wire • EVERYTHING diecut! • Giant cowl turning (P26-A) • Preshaped wing struts • Easy-interlocking bulkheads and keel construction (or notched sheet sides) • Routed-out wheel shoes • Tails are diecut sheet • Handy Bulkhead notcher in ea. kit • Stunt and sport rib (symmetrical) • Many other outstanding features.

THREE SWELL "SIMPLEX" JETS

RUGGED, REALISTIC, AND PROFESSIONALLY PREFABBED, THESE NEW "SIMPLEX" KITS ARE MASTERPIECES OF PREFAB FLYING SCALE — QUICKLY, EASILY ASSEMBLED.

All the curved balsa parts are diecut, and they interlock without fail, assuring fast, pleasant construction. Included are such popular features as shaped, notched, wing edges - formed celluloid bubble canopies - three-color decals - quality tissue - preformed landing gear wire - turned wheels - and many other outstanding features such as a handy "notcher" (A Cleveland development) which makes smooth work of the few small notches that cannot be diecut. Furthermore, the directions for assembly have been organized in step-by-step order, and are illustrated clearly with sketches. Everything needed to complete the model is in the kit, with the exception of liquids.

Those of you who have built "IT" kits in the past will really take to the "Simplex" kits too, as they carry the ideal of realism and flight engineering into the realm of prefabrication. Simplex models are much bigger than the spans (15 to 20") imply, as their fuselages are huge compared to the spans.

These 3 sleek jets are among Uncle Sam's most talked about, most promising fighting jets, and you'll see them in the headlines, and in the newsreels every day. Ask your local hobby dealer right away, for the biggest dollar's worth of model yet to be seen! — He'll show you the "Simplex" kits!

$1 ea.

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15" LOCKHEED F-90

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- SHAPED WING EDGES
- FORMED PLASTIC CANOPIES
- INTERLOCKING TYPE CONSTRUCTION
- THREE-COLOR DECALCOMANIAS

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Dope Can

News, Views, Comments and Photos from Model Clubs and Enthusiasts in U. S. and Overseas

■ "A quick line to advise that this year's Air Force show is in the blue," airmails Lt. Harry G. Vogler, Jr., from Amarillo Air Force Base, Texas. "The time: 9 through 15 July 1952. The place: Amarillo AFB. Project Officer: guess who—but little me!!!"

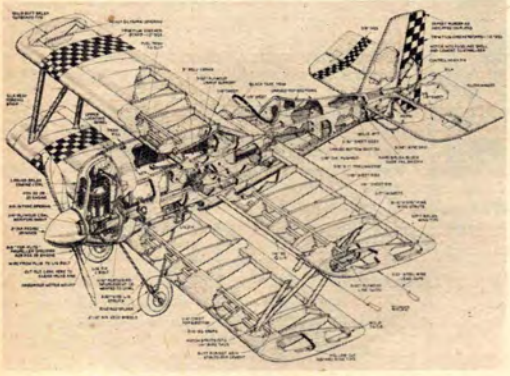
Official title for the fracas will be the Air Force World-Wide Model Airplane Championships. We knew Harry was hoping to duck the assignment this year after having worked so hard on the first AF meet held last year at Sheppard Field. But apparently the USAF recognizes an eager beaver and a competent contest director, so the AF lads are assured of another darn good contest with HGVJr in charge.

We hear that Harry is initiating every effort (as the military puts it) to incorporate radio control as a permanent factor in the Air Force meet. He'd also like to include combat flying and R.O.W. free flight events. That makes the present scope of the service championships as follows:

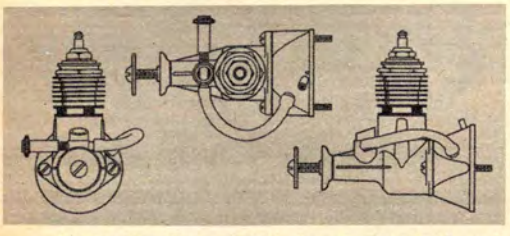
Free flight, gas powered—Half-A, A, B, C-D, Half A R.O.W., A-B R.O.W., C-D R.O.W. Free flight, rubber powered—combined rubber, Wakefield R.O.G., flying scale, hand-launched glider, towline glider. U-control—A, B, C and D class speed; jet speed; flying scale; combat; team racing; A-B (*Continued on page 78*)

Fancy this! John Clark arrives at England's All Herts contest with 11 ft. towliner; Shirley Price's model is no back-breaker.

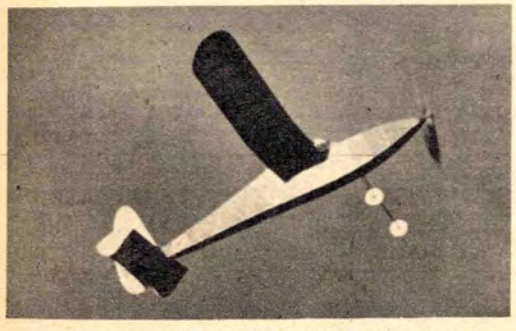
You asked for it!
Here it is.....
AIR TRAILS
Model Annual
for 1952



. . . lots of those famous Rolfe cutaways!



. . . big collection of full-size engine 3-views!



. . . many exciting new models, all types!

Mail this special reservation coupon right now! Copies are limited!

Yes, modelers, the biggest buy in model aeronautical reference works, the "AT" Annual for 1952 is going to press! Already famous for its valuable models, building aids, hints and kinks, plans of outstanding contest and sport designs, the '52 Annual is better than ever; it will help you build winning models and have more fun with your model flying. And—*now*—for the first time you can order your personal copy of the '52 Annual from Air Trails by mail. Just fill out the copy reservation coupon and mail with 50c (the regular newsstand price). The print order is limited—so take a hint, reserve your copy right now!

Special Section! Air-Model Manual of Elementary Modeling!

Just the thing for new modelers, especially that recruit you're helping along. Includes proper use of rubber motors; how rubber is prepared; breaking-in hints; correct lubrication; multi-strand braiding; finishing your model, including sanding, filling and filleting operations; how to spray and trim; use of pastes, waxes, dopes, fuel proofers; control systems for Half-A U/C jobs; tank arrangements; take-off procedures; selection of right propeller; adjustment and sensitivity; caring for your engine; how to break in; getting more power from a motor; starting tricks; types of glow plugs.

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Plasticote excellent for free & control line flying.
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3-4-5-6-7-8-9-10 Pitch 15c
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3-4-5-6-7-8-9-10 Pitch 15c
7" dia.
4-6-8-9-10 Pitch ... 20c

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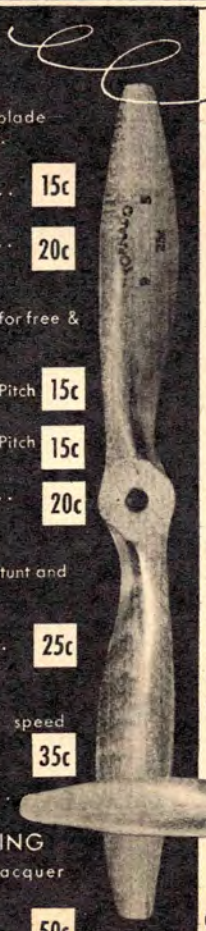
7" dia.
8-9-10 Pitch.... 35c

STANDARD RACING
Hardwood with lacquer finish.
7-8-9" dia.
9-10-11-12-13 Pitch 50c



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Ask your dealer to show you these sensational props today! Take the guesswork out of flying and consult the Tornado Prop Chart for accuracy. Keep ahead with *Plasticote*.

GRISH BROTHERS
ST. JOHN 1 • INDIANA

Combateer

(*Continued from page 45*)

the upper and lower tank mounting flanges is solid before mounting holes are drilled. Mark, drill and tap corresponding holes in the aluminum plate. Install landing gear wire into the hole drilled into the aluminum plate. Fit mounting bracket around wire. Drill and tap holes for hold-down bolts on landing gear.

For those who can't find material for an aluminum motor mount, a suitable one can be made as follows: Install a ½" piece of plywood, long enough to mount your engine, between the front ends of the fuselage sides. Saw to fit your engine and bolt engine into place. Install a ¼" plywood firewall at rear of engine. Use a plug-in landing gear, the holes for same being drilled through motor mount plywood into ¼" plywood firewall. Install a wire hook at the top of the fuselage over the wing spar. The landing gear and tank are held in position with rubber bands.

We start construction by cutting six inches off a ½" square x 36" long piece of hard balsa. Glue the 6" piece to the top center of the 30-inch piece. Cut and glue the ⅛" plywood fuselage former to the front center of the wing spar. The fuselage sides are cut from medium ⅛" sheet balsa. Draw center line on outside of fuselage sides to aid in lining up wing and motor mounts. Cut two ¼" sheet, soft balsa, ribs and glue in position on fuselage sides. Mark wing rib positions on top of wing spar. Slide fuselage sides on wing spar and glue ⅜" plywood motor mounts between sides. Be sure this plywood mount is ¼" below, and parallel with, the center line of the fuselage sides.

Lightly glue in fuselage former located between the wing trailing edges. It must be removed later to install the control pushrod. Slide stabilizer in slot and line up with wing spar. Do not pull ends of fuselage together or glue in stabilizer at this time. Set assembly aside to dry.

Cut trailing edge balsa to size. Build the trailing edge on a flat surface using several small rib ends to hold the top piece of trailing edge at the proper angle. Cut wing ribs, noting that on the outside eight ribs, the spar hole is below the center line of the wing. The holes in all ribs should be a tight fit on the wing spar. Slide wing ribs to proper position on spar. Line up and glue wing ribs to spar. Apply glue to rib ends and slide trailing edge on. Add leading edge and check for wing warp. The glue should still be soft enough to allow you to line up your wing so that it is free of warps.

When wing is dry, add wing tips and gussets. Add one ounce of lead to outside wing tip. Glue fuselage sides together at rear and glue stabilizer in position. Install control horn and hinges on flipper and mount on stabilizer. Remove fuselage former located between wing trailing edges. Bolt bellcrank to plywood plate. Bend and fit control pushrod and glue plywood plate in position. Notch fuselage formers to act as control pushrod guide and reinstall.

Sheet top and bottom of fuselage as indicated on plans. Cut and glue rudder and sub-rudder in place—noting offset. Install lead-out lines from bellcrank. One lead-out line is longer than the other to prevent wire clips from binding. Cover with medium weight Silkspan. The original ship was finished with one coat of clear dope, brushed on, two coats of color dope, sprayed on, and one coat of hot fuel proofer, brushed on.

The finished ready-to-fly ship weighs between 18 and 20 ounces.

There's More All 'Round Fun With MONOGRAM Models

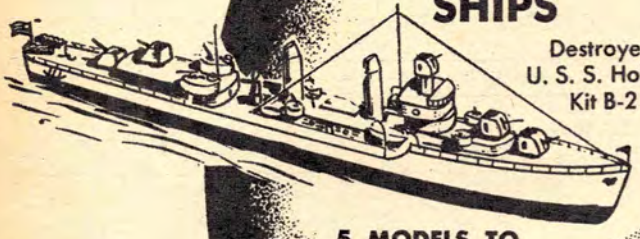
Illustrated, Navy's Gull Wing Corsair,

Kit G-14

SPEEDEE-BILT *flying models*

15 MODELS TO CHOOSE FROM

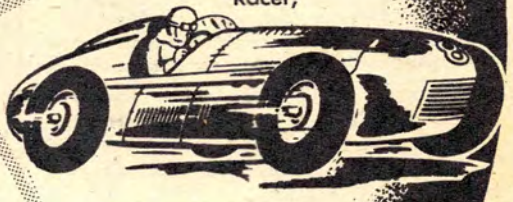
Famous **U. S. FIGHTING SHIPS**



Destroyer, U. S. S. Hobby Kit B-2

5 MODELS TO CHOOSE FROM

Mono-jet, Indianapolis type Jet Powered Racer,



JET POWER RACERS

5 MODELS

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AERONCA, Kit G-2
MONOCOUPE, Kit G-3
ERCOUPE, Kit G-4
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SNS

■ The All Western Open proved to be full of surprises and disappointments, with model builders from as far as Phoenix and San Francisco gathering for real flying sessions.

At the proposed flying site we found that fellows were flying directly under commercial airliners which were taking off from the Los Angeles International Airport. Quite a few ships were upset by the turbulent prop wakes of these DC-6's and Connies, so it was decided to move the free flight site. The new field proved sandy and soft. After the fifth car had bogged down, those who were behind stopped. All the cars had to be practically carried out of this mess, a feat which lowered the height of those hand launched gliders considerably.

When flying started, timers were worth their weight in gold. The recording table was soon swamped with anxious contestants waiting their turn to fly. Thanks to Russ Johnson and John Bollinger, things got smoothed out. Thermals were

few and far between. Red Everitt and Lo Salisbury seemed to hook into the only decent one for two really nice rubber flights, with lots of other guys champing at the bit while waiting to get in the air. Those thermals which were handy seemed to be quite low and north of the flying site, as Jack Oxley soon found out for a very sweet maximum in the tow line event. At about 10:30 the, er, Los Angeles smog swept in and those who did manage to hook in were out of sight in less than five minutes.

In the meantime the indoor events were being held in the Western Air Lines hangar in a mild gale, under a 30 ft. ceiling. Needless to say, when the really good fellows like Joe Bilgri, Hank Cole, etc., learned that the contest was not to be held in Santa Ana, they canceled their scheduled trips. The only reason we could find for the transfer of the indoor events from the balloon hangar to the airport: Santa Ana was too far away. *Tsk, Tsk and tut, tut.*

Walt Mooney's 1908 Bleriot IV A/2 flying scale. Power: a Wasp. Trike gear, 2 wheels in front. Scale V-8 engine, extension shaft.

Ernie Wrisely, one of the few guys who will fly his top-notch ships under any conditions, won the contest with an amazing flight of slightly over five minutes, the ship flying more backward than forward. Ernie still feels cheated since the only time

Bob Palmer with his "Smoothie" design. Span is 52 in.; length 32 in. Tornado prop on Veco .29. Silk wing, tail, hollowed fuse.

he has had a chance to fly an indoor ship was with his very first one, which did almost nineteen minutes on its initial official flight—and then exploded when a motor broke on its second winding. Since this first ship he has been (*Continued on page 72*)

W. G. Casselberry and his "Sleek" which has 750 sq. in., 40% stab. Wt., 34 oz. Flies B-C on Torps. 12 1/8" sq. spars in wing.

Fox .59

(*Continued from page 52*)

ability to run at full power output during flight with a varying flow of fuel coming to the engine is of utmost importance in a stunt engine. The Fox .59 comes through with flying colors in this respect. Lifting the tank up and down while the engine was running to make our "Fuel Level Test" showed a maximum variation of 18 inches, which is three times greater than the average and the highest figure yet reached in any of our tests.

Many carefully worked out details in the design of the engine account for this. To start with, the base compression ratio is quite high due to a very compact and small diameter base. This delivers a greater suction when air is being pulled through the carburetor with resulting stronger fuel suction at the needle valve.

Another unusual feature seen in this engine for the first time is the relative port areas. The air intake space at the needle valve is about normal for a .59 engine; however, the rotary valve and passage connecting the needle valve to the base are two or three times larger than most engines. This allows the full suction of the base pumping action to reach the needle valve rather than being lost while passing through the rotary valve to the base.

The fuel bypass is very large but the cylinder ports are average size. Large cylinder ports help produce high rpm but they open before the full power stroke is complete and reduce pulling power at medium speeds. Cutting these ports much higher in the cylinder would give the Fox .59 phenomenal high-speed performance but destroy the brute pulling power necessary for stunt.

The engine test was started with a thorough "break in," which proceeded quite slowly with an 11/8 propeller. After several hours the engine still showed a tendency to be tight and had the symptoms of "drinking up fuel" because the needle valve had to be left rich to prevent overheating and stopping. The tendency will disappear after a complete break in.

It was necessary to change over to a small 9/6 propeller for a half hour to get the engine limber enough for good stunt performance. Changing back to the 11/8 plastic propeller showed that the trend toward overheating was gone and the engine was not at all sensitive to needle valve adjustment. The piston and cylinder are constructed of a high-grade meehanite and wear very slowly. This makes the break-in process slow, but results in long engine life once the engine is in good condition.

Starting the engine cold is very easy with a light prime in the exhaust and intake. When the engine is quite hot it still has good compression but fails to start with a prime in the exhaust. It gives a short burst and spits all the fuel out and then stops. After experimenting it was found that the engine could be started hot by putting a heavy prime in the intake and quickly starting to flip. After 8 or 10 flips the extra fuel worked through and the engine started at the first burst of power.

Some engines in the .49 and .60 class have a tendency to throw the propeller loose when operated on glow fuel. This did not happen during the test and can be attributed to the well-designed drive washer and splines attaching it to the crankshaft. The engine would overheat at first and slow down, but did not freeze up and become stiff after it had cooled for a few seconds. The manufacturer says the new carburetion system "eliminates sagging or stuttering due to fuel surge or bubbles." To check this the fuel line was pinched closed while the engine was running. The engine did not stop when the fuel supply was cut off for three-quarters of a second, although the propeller came almost to a standstill.

(*Continued on page 62*)

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Bonnie Lass

(*Continued from page 35*)

lines to pick up speed. Try changing back and forth from high to slow speed and do this without varying the altitude. Now try this in circle with three or four other models. With this type of performance you are flying on the ragged edge of a stall, and naturally this should not be attempted in much of a wind. Lines as short as 15 feet can be used with this set-up.

For a real good team racing show, have all the models ready to go and all the races planned ahead of time so that the whole demonstration can go smoothly. When in the air keep the models closely bunched by adjusting the speeds. Cooperate in the circle so that first one model will pass the bunch and then another. The spectators will enjoy team racing a lot more when there is a close race than when the models merely scream around the circle at top speed.

Cut out the wing ribs from 1/16" sheet and the wing tips from ¼" sheet balsa. Place wax paper over the plans and then pin spar, ribs, leading edge, trailing edge, and tips in place, blocking up where necessary with scrap balsa. Cement securely and when dry remove from plan. Carve and sand all parts to final shape. Cover the bottom center section with 1/32" sheet balsa. Install the bellcrank, cutting away part of the center rib for clearance. Install the aluminum tubes in the left wing tip and the lead weight in the right wing tip. Install the lead-out wires using .008" flexible wire. Cover the upper center section and then cut away where necessary to clear the pushrod. Cover both panels with gas model Silkspan and give two or more coats of clear dope.

Trace the tail surfaces onto sheet balsa and cut out. Carve and sand to a steamline shape. Use any type of hinge construction that will permit free action. The weight of the elevators in the finished model should be sufficient to move the controls to full down position. The original model used a series of eye pins with a music wire hinge pin to form the control horn.

Cut landing gear to shape from .025" 24ST dural. Bend to shape, drill holes, and attach wheels. If dural is not available, a two-strut 3/32" wire gear can be used. Bend tail skid to shape from 3/64" music wire.

Saw the fuselage block in two lengthwise and then spot-cement it together again. Since the fuselage is perfectly round, turn the block on a lathe if possible. If not, then temporarily cement the spinner in place on the end of the block, hand-carve the fuselage to near shape and then finish with sandpaper. Half-circle templates can easily be cut from heavy cardboard or veneer. Pencil lead rubbed on the edges of these templates will quickly mark the "high" spots and greatly speed the shaping. Split the fuselage open to form a top and a bottom block. Hollow these out as shown on the plan, leaving thick portions at the engine bulkhead and landing gear positions.

Next glue the tail skid into the lower block and use a small piece of linen to help secure it. Glue landing gear mount in place. Cut away bottom of fuselage so that the gear may be bolted in place. Then replace the piece cut out. Mount the engine and spinner in place on the plywood bulkhead #1 using a nut plate behind the bulkhead. Cut away the side of the fuselage to clear the engine cylinder and venturi, then carefully cut a groove in the fuselage block until the engine and bulkhead fit properly. Glue securely in place and reinforce the joint with narrow strips of linen cloth.

Glue bulkhead #2 in place. Cut block away where necessary and cement the wing and stabilizer in place. Hook up the control pushrod. Mount the tank in place using scraps of balsa to cement it in securely. A stunt type of tank was used in the original *Bonnie*

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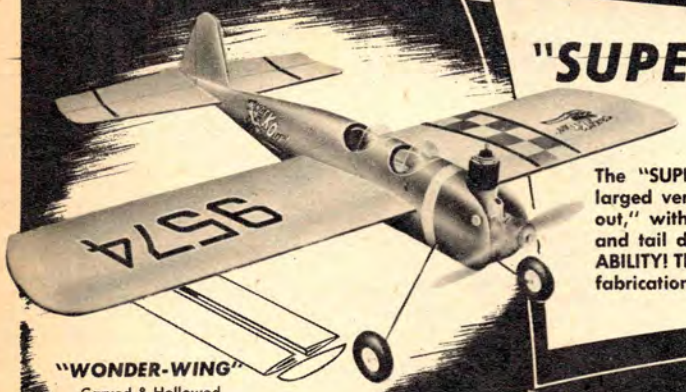

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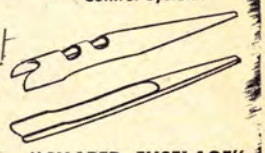

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Lass with one copper tube vent coming out of the top of the fuselage for fill, another out the bottom for overflow, and a third copper line through the bulkhead for feed line. Cut the two vents on a 45 deg. angle forward.

Cut cockpit hole in upper block, then carve and glue headrest block in place. Glue rudder in position. Install dummy pilot and instrument panel. Carefully cut away the top fuselage block to clear the engine, bulkheads, and control mechanism. Glue permanently in place.

Carve the cheek cowls from blocks and hollow as shown on the plan. Cut out the right cheek cowl to clear the glow plug, then cement both blocks in place. Mark carefully the position of the removable portion of the cowl and with a sharp blade cut this portion off. This hatch is held in place with two large-size dress snaps. Cut exhaust holes in both top and bottom of the fuselage. Make an extension for the needle valve and cut a hole to fit. Cut an air inlet hole in each cheek cowl, and an air outlet hole in each cowl underneath the wing.

After sanding entire model, apply two or more coats of sanding sealer. Sand lightly between coats. When smooth, paint entire model with a light colored fuel-proof dope such as Sta. Attach canopy, put on decals, numbers, insignias etc.

The finished model should balance ¾" back from the leading edge of the wing alongside the fuselage. The original model weighed six ounces and has flown when loaded down to a total weight of 12 ounces. For regular flying use a 5½/4 prop and keep the weight down to normal. With such a set up *Bonnie Lass* flew 113 laps on ½ ounce of fuel. Its top speed was about 50 mph. After you have the feel of your model, get one or two others to fly similar models in the circle with you and learn just how much fun team flying can be.

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Fox .59

(*Continued from page* 59)

Engine Data

Performance. Bare weight: 10.57 oz. Propellers—11/10 wide blade wood: 9,800 rpm; 11/8 plastic: 11,800 rpm; 10/8 wood: 11,000 rpm; 10/6 wood: 13,500 rpm; 9/7 wide blade wood: 15,000 rpm; 8/9 wood: 15,500 rpm. Fuel: hot mixture not required for full power. Fuel level test: 18" at 11,800 rpm.

Design Data. Displacement: 59 cu. in. Class: D. Stroke: .906 in. Bore: .920 in. Stroke bore ratio: .984. Compression ratio head: 5.5. Compression ratio base: 1.44. Port area intake: .222 sq. in. Bypass: .137 sq. in. Exhaust: 168 sq. in. Ignition: O&R racing glow plug.

Construction Features. Bearings, crankshaft: two ball bearings. Crankpin: aluminum. Wrist pin: aluminum. Extra long shaft. Lightweight lapped piston. Large rear rotary valve. Plenty of finger clearance when adjusting needle valve.

Parts Illustrated

1. Crankcase and ball bearings: aluminum die casting, 2.86 oz. 2. Glow plug: steel, ¼-32 thread, .08 oz. 3. Glow plug gasket: copper, .030" thick. 4. Cylinder head: aluminum die casting, 1⅝" dia., .85 oz. 5. Cylinder: meehanite, .921" bore x 1 9/16" long, 1.99 oz. 6. Connecting rod: aluminum, 1½" long, .12 oz. 7. Piston: meehanite, .921" dia. x 29/32" long, .49 oz. 8. Wrist pin: steel, .218" dia., .08 oz. 9. Rotary valve: steel, hardened and ground, .624" dia., .43 oz. 10. Back plate and carburetor: cast aluminum, .66 oz. 11. Head bolts: steel, 6-32, .30 oz. 12. Crankshaft: steel, hardened and ground, .375" dia., 1.73 oz. Drive washer: steel, hardened, 1" dia., .26 oz. Propeller washer: steel, ⅞" dia., .15 oz. Propeller nut: steel, ¼-28 thread, .07 oz. 13. Rear cover bolts: steel, 4-40 thread, .06 oz. 14. Needle valve assembly: brass and steel, .072" needle, .44 oz.

R/C Roundup

(*Continued from page* 10)

Angeles Radio Controllers, formed recently with Dick Schumacher as Pres. (Dick got hooked as he was out of town at the time and couldn't fight back!) This group has not settled on regular meeting nights as yet, but they fly every Sunday at the Sepulveda Dam Basin, a place, by the way, which has an area of 1¼ by 1½ miles, and which is almost completely dry, except at flood times. The area is being made a permanent free-flight site by the Los Angeles City Parks and Recreation Dept., after about four years of effort by flyers of the area.

The L. A. Radio Controllers have joined the Southern Calif. Model Assoc., with the result that there will be an R/C Event at all major Coast contests from now on.

E. L. Rockwood of Walnut Creek, Calif., writes that the PRCS does not meet at his home, but rather at a local hall. This seems to indicate a pretty large membership. Alternate meetings are held at various members' homes as much as 100 miles away to give all the boys a chance at meeting attendance.

An interesting letter from Bob Larson states he has finished building a plane he calls "Electron" which has turned in some fine flights. It weighs 5½ lbs., is nylon covered, and carries a 2-tube receiver operating rudder only. A new ship is on the drawing board that will have elevator, rudder and motor controls. Bob operates under somewhat of a handicap—he builds and "flies" from a hospital bed. He's a patient at Erie County T. B. Hospital, Erie, Pa., and would like especially to hear from some of the gang who use tuned-reed equipment, as this is what he and several Ham friends hope to install in the new plane.

Roy W. Repp (W3TZW), 48 Kendal Ave., Bellevue, Pittsburgh 2, Pa., is another experimenter interested in details of tuned-reed systems. As Roy states, it takes a pile of dough to get a good R/C job working well, and most of us can't spend a lot on research in the wrong direction.

Q. and A. Several readers, including Joe Rusk (Wheeler, Ala.), Robert Livin (no address), and Harry Barr (Hamilton, Ont., Canada) want to know if R/C'ers cannot use the 27 mc. "Home Diathermy" band without a license. Rumors have been floating around that this is O.K. if you have a factory-built and tested transmitter. No, it is not legal. This is a regular Ham band.

just like 10 and 6 meters, and you must have a license to work in any one of them, regardless of whether the transmitter is home or factory built. One little ray of sunshine creeps in here, though; the new Novice license with its greatly simplified requirements covers 27 mc., though the Novice must use crystal control. If we ever get a true "license-free" band it will be on 27 mc. and crystal control will undoubtedly be required.

There's another question that seems to bother a lot of R/C beginners. It is simply: how can a ship be looped with only rudder control? Really simple to describe—if not so easy to do! You put the ship in a tight turn with your rudder, and if the plane is properly trimmed it will turn tighter and tighter into a screaming spiral dive. No free flighter need be told how fast a ship can move in *this* maneuver!

When you think it's going fast enough, or your nerves can't take it any longer, give opposite rudder. This should snap the plane out of its turn, and as soon as it is going straight, neutralize the rudder. The plane should now nose up sharply, due to its excess flying speed, and if you're lucky and the wings are still on, it may go over the top in a nice loop.

Some ships will do several loops in a row, and a few can be looped this way in a glide. Hope that straightens *that* out for Carlos Encarnación (Cabo Rojo, P.R.), and Cpl. Don Marshall, who services telephones in the Army. Don is also interested in the use of ailerons instead of rudder. This has been tried by a few, but the advantages don't seem to outweigh the complicated linkage needed to move the two ailerons. Everyone who has tried this always seems to go back to rudder.

Technical Notes. Tests on 27 mc. in several parts of the country have shown quite a bit of interference. In some cases, it is suspected that this may be due to using a receiver which is a lot more sensitive than it needs to be for normal R/C ranges. We feel this problem could easily be solved if a large number of R/C builders got to work on this band.

Quite a few new Novice licensees are doing just this, and we would like to ask them to send us their experiences on 27—not only in the line of interference, but how about range, stability of various receiver circuits, types of antennae favored, etc. Come on, you "experienced Novices," let's give the uninitiated a helping hand.

Have heard from several readers who are using two-tube receivers on the lines of the Control Research "conversion kit." Some are having fine results, which is what our own test shows. Others . . . well, one fellow we know did a neat wiring job on his two-tuber, but couldn't get it going. Diagnosis: he used acid-core solder! The only thing he could do was a complete rewiring, using mostly new parts. The moral: never, NEVER, use acid-core solder on any electrical connections!

Another builder used a cheap paper condenser between the RF choke and grid of the second tube. Since no grid resistor was used on the second tube per recommendations, and the condenser was "leaky," a positive voltage was applied to the grid, with all kinds of bad effects. Better use a mica or even a ceramic condenser at this point.

An addition to the two-speed set-up we showed on p. 10 of the Nov. issue which will give motor cut-off at any time desired has been worked out by Howard Bonner. You insert a T-piece in the high-speed needle fuel line, and run a tube from this to a stopper on the *armature* of the motor escapement; two-speed still works as we described.

Cut-off comes when you pulse the transmitter continuously for several seconds. This causes the motor escapement to operate quite rapidly, opening the stopper on the *high-speed* fuel line fast enough to break the fuel flow, thus killing the engine.

Users of XFG-1 tubes may have experienced mysterious intermittent troubles as we did. This was traced to a very thin lacquer on the leads; the manufacturer apparently dips the leads and press in this lacquer, which must be carefully scraped from the leads with a razor blade, especially if you use any type of lead clips or socket to hold the tube. If the tube is soldered in place, you probably won't be troubled by this lacquer.

A neat and simple control system, especially adopted for ultra-light planes, was described to us by John Worth. The sketch shows the deal. A two-tube receiver is required (or at least one that will assure a full 1/32" of movement of the relay armature). The plane is trimmed to fly in a tight circle, let's say to the right, but not spin; for a right turn the relay is operated (signal on or off, according to type receiver used), which allows the prop to spin freely, flapping the rudder back and forth, with no turning effect on the plane.

(*Continued on page* 66)

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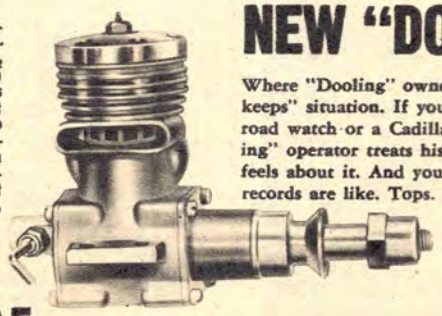

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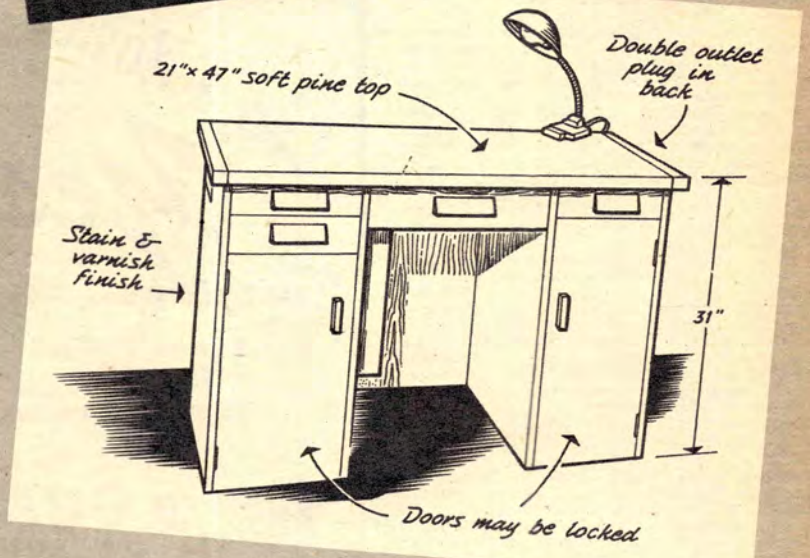

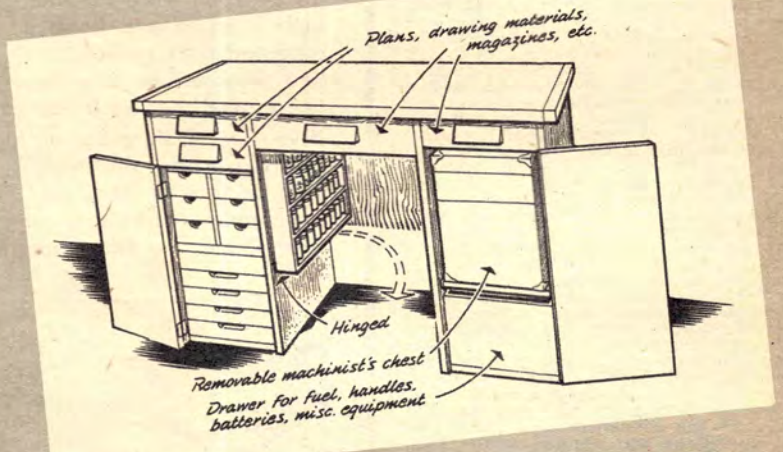
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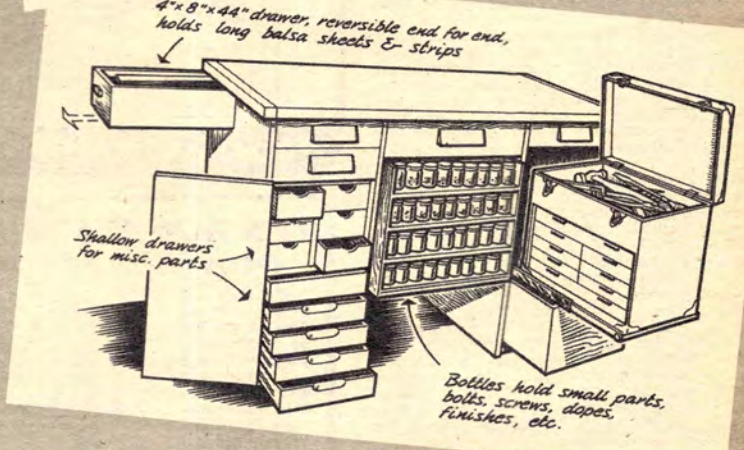
Hinged
Removable machinist's chest
Drawer for fuel, handles, batteries, misc. equipment


4"x 8"x 44" drawer, reversible end for end, holds long balsa sheets & strips
Shallow drawers for misc. parts
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This ingenious desk, designed and built by Canadian modeler Sgt. N. E. Tustin, Arnprior, Ontario, can contain any reasonable assortment of modeling paraphernalia, yet is neat enough to hold its own as a regular piece of household furniture. Tool chest lifts out for trips to the flying field. An unusual feature is the long drawer for warp-free storage of strips, sheets. Dimensions and construction can be varied.

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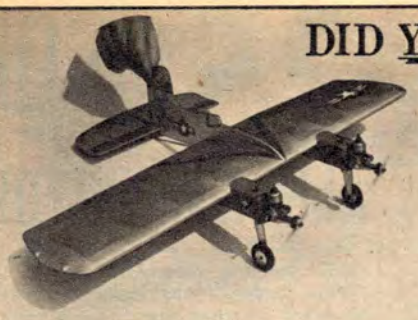

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DMECO MODELS FOR FUN AND PLEASURE

Wakefield

(*Continued from page 39*)

interest in Wakefield modeling, but have been adverse to attempting such a project because of their unfamiliarity with the type of model required. The answer seems to be the "Half Wakefield" models that many fellows are building. Basically, the only differences in these smaller models are that they feature half the total surface area limitations and fuselage cross-section requirements found in regular Wakefield models. Construction problems have proved less difficult because of the smaller size, while the flight characteristics remain very much the same.

The design we have outlined is intended as a stable high-performance trainer. While it incorporates many of the desirable features previously discussed, weight has been sacrificed slightly so as to obtain a model better capable of withstanding rough handling and maladjustments.

The design configurations that have been suggested could be scored in this manner: In the rate of climb category we would select the Push-Pull, first, with the Canard a close second, and the conventional design, third. The length of motor run honors go to the Push-Pull with the conventional design a close second and the Canard third. In stability the Canard is king, with the conventional arrangement second, and the Push-Pull, third. Considering the glide, the Canard will hold a slight edge over the conventional design, with the Push-Pull third.

PHOTO CREDIT LIST

Pages 18-19—Naval Aviation News.
Page 22—Short S.A.4: Howard Levy.
Page 24—U. S. Navy.
Page 25—New York Mirror.
Page 29—Fudo Takagi.

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(*Continued from page 63*)

For left turn, the relay is opened; the armature catches the bent shaft, to hold the rudder left. For neutral, an occasional pulse is required to give alternate left rudder and offset the right trim. A Rudevator spoon could be used in place of the rudder and prop shown, but the latter is probably less conspicuous. John says a local flier, Don Hewes, employs this arrangement in a .049 ship with good results.

Brother Worth also mentions that he has done a lot of flying with a Trammell actuator hooked to his rudder. This sounds like proportional control, but isn't, for he uses only a pushbutton on the transmitter; button down, left turn; button up, right turn. For neutral, just pulse it slowly to wag the rudder. He likes this better than escapement, as it is light, fast, and there is no rubber band to wind.

Sounds very sensible. We've flown with true proportional control and find that we often keep hitting the control lever for a series of full right or left rudder movements alternating with neutral, rather than holding a *little* rudder *continuously* when making turns, as you can do with this system. As far as a spectator can see, the flight result is the same either way.

Fran McElwee tells of an ingenious scheme he saw at a recent meet. An Army major (name unknown) had a pulse control setup with elevators connected to rudder so that they were pulled up in either right or left. When pulsed slowly, a slight up effect was had, as the rudder was in full right or left more than in neutral. Turns also gave up-elevator—the ship couldn't spiral-dive. With faster pulses, the rudder sort of "floated" near the center position, giving effect of slight down-elevator and level flight. The ship was a Scientific "Mercury" with O&R .29 on glow.

Jim Schenck and Norm Tauberg have rigged up an arrangement, developed by Lou Errington, which they can use for motor cut, bomb dropping, etc. These flyers use 4-arm rudder escapements and "beep-boxes." A stop is put on the beep-box drum to hold it in the half—or current-on position, as desired. A U-control relay is hooked up as shown here, and a delay of about .2 sec. occurs if R is 100 ohms; 120 ohms gives .5 sec. delay, and 130 ohms about 1.2 sec. A delay is necessary, of course, to keep the auxiliary circuit from functioning at every pulse sent to work the rudder escapement. For bomb dropping, the device shown in (b) is used. The length of the nichrome wire is varied to get the desired delay in actuation.

Commercial News. Word comes from E. L. Rockwood, Walnut Creek, Calif., that he is now perfecting a 3-channel tone system with a Bonner dual escapement for right or left rudder—no sequence; third AF tone used for motor control. Rockwood states that his single-tone system weighs only 1 lb. installed with all batteries, while the regular 3-tone job totals only 22 oz. The latter will weigh considerably less with the dual escapement noted above.

A kit for a "revamped" Rudderbug has been worked up by David Wolf, 3257 Queenstown Drive, Mt. Rainier, Md. Developed in collaboration with designer, Walter Good, the ship retains same flying characteristics as the original, but is much stronger with no increase in weight. Construction time is said to be about 10 hours. Geodetic wing design is a feature. The kit is priced at $17.50 and is available only from Wolf; it includes full-size blueprints, 3" Veco airwheels for main gear and a 3½" Veco nose wheel, spruce longerons, etc.

As we've mentioned before, the Amateur's License Manual is available for 50¢ from Amer. Radio Relay League, West Hartford 7, Conn. (also at many radio supply stores). This has recently been revised to include all latest changes in F.C.C. regs, including the Novice and Technician Class licenses. It contains sample questions as asked on all Ham license class exams, plus diagrams, if required.

Another 50¢ publication of great value to the R/C beginner is A.R.R.L.'s booklet, "How to Become a Radio Amateur," which consists mainly of elementary electrical and radio theory, and construction details for simple transmitters and receivers (designed for communication, of course, not for R/C). They have still another at 25¢ called "Learning the Radiotelegraph Code." All three are indispensable to R/C converts who aspire to any of the various classes of Ham tickets.

Mail Requested. This is probably all the space we can wheedle from Editor Lewis for this month. We close with *two* requests for mail. First—write your Senators and Representative requesting, or better, *demanding*, a free band on 27 mc., as mentioned in past columns. Come on, gang, flood 'em. Second—flood us, too, with comments, questions, circuits, gripes, contest and flying news. Let's hear from you.

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Red's Wakefield

(*Continued from page 28*)

which the ship did not get up nearly as high as with a smooth run due to a bent shaft. It can be said that over 30 seconds of flight were lost on these occasions.

The snaft is .072 wire; go to a hardware store to obtain it. Straighten and have the end threaded 1-72. Get your local machinist to do this if you lack your own die and tap. The pawl was made from chrome moly, heat treated over a gas flame, as was the wire before threading. The wire is heated to a brignt red, then put in the oven at 400 degrees.

Open the oven door and move the wire to a point where it can cool off slowly. When hardening again heat to a bright red and quench in oil; *do not use water* since water will make it glass hard and very brittle. Ernie Wrisely has made a pawl from 75ST which seems to be holding up, so it may be wise to try this. The spring was an old Ohlsson timer points spring cut down to size and cemented in the wood dowel.

Although the nose looks quite heavy, it is lighter than one of balsa and a lot stronger. The complete weight of the nose block, prop and bobbin is 22.3 grams. The dual bobbin serves the purpose of keeping each motor half separate and allows Red a very simple, strong removable bobbin for easy winding. In order to hold the bobbin still to connect the prop to the fully wound motor, a piece of music wire is slipped through the hole in the middle of the bobbin. Note that the nose block is also keyed to the fuselage through the flat in one corner; this eliminates chance misalignment.

An entirely new method for preparing motors was used to get them to tension properly every time. Everett makes his up in two sections; in the case of this ship, two motors are made, one of eight strands the other of six strands, each 60 inches long. Each is wound separately for tensioning, in the same direction, 120 turns. Another trick we have seen him use to make the prop fold while the flight is still flat, is to increase these tension winds.

In prewinding the motor Red is very careful. Starting with 100 winds he carefully puts on 100 at a time, increasing these until he reaches 90% winds. At no time does he exceed this figure since he thinks it takes too much out of the motor. That old rule of thumb of stretch out five times was also discarded. Through correspondence with Ron Warring it was found that a much greater safety factor is present when one stretches only 3½ times, so Red is very careful and will pace off the required distance prior to each winding. When using such a long motor it is also necessary to come in while winding at a definite pace so that complete winds are put on smoothly; if you don't do this large knots form, which will not come out in flight.

As for testing, Red goes about this very slowly, carefully thinking out each adjustment before it is made. With the wing and tail fixed he tries to get the C.G. at 40 and 45% of the wing. Very little incidence changes were made, and these with thicknesses of paper. Side and downthrust adjustments were made with paper. A very good glide was obtained before any real power was put on. When power was applied it was put in slowly; in fact Red spent weeks before he finally wound it fully.

Red has found that excessive downthrust is the cause of a model starting to come down before folding, consequently there is very little if any downthrust in his model, compensating adjustments being made in the form of side thrust when a stall occurs.

When fully wound the ship shoots into the air very fast at a fairly high angle of attack. This continues for about 30 seconds, whereupon it settles down to a smooth slow climb. It goes up for about 90 to 100 seconds, then

Actual Photograph of model built from Kit B-3—Length 19" Beam 5"

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levels out for the last 10 to 15 seconds. There is no change in attitude or circle when the prop folds.

What is probably the best flight this ship has made was accomplished at the L. A. Wakefield Eliminations when it flew for 6:12 on a 1:50 prop run with slightly over 1000 winds.

One final word of caution. If you expect to get flights close to those Red does, you must build your model very carefully and down to the weights of the original. Power to weight ratio plays a prime part in the climb and you must get upstairs with a long motor run. Duplicate the model or use these ideas as you see fit. Just give your model a fair trial. Keep it light!

Batiri

(*Continued from page* 32)

If it should stall, correct by reducing wing incidence. Should it dive or the glide be too fast or too steep, add incidence. Make sure you glue corrective wedges before further flying.

For your first powered flight run your engine with the needle valve as far open as possible to keep the engine speed low. Hand launch into the wind and observe the model's attitude. It should have a very shallow climb with almost no turn. When the engine cuts, observe the direction and size of the circle in which it glides. If the circle is quite tight, you are in trouble and had better check your wing and tail surfaces for any signs of warping before proceeding. If the model glides straight or in a very open circle, you are ready for further testing.

Incorporate some roll (bank) by tilting the stabilizer. Approximately three degrees should be sufficient. Place a sliver of wood under the left side of the stabilizer for a left turn. Now try a second powered flight, leaning out your

FOREIGN News-Notes

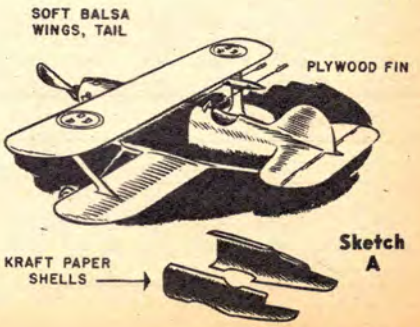
■ English engine designer Ted Martin, in series of articles titled "Tuning for Speed" in *Model Aircraft* magazine, torpedoes belief that lengthy run-in of racing engines is essential. Idea dates back to industrial revolution days, says Martin, when manufacturing processes were crude and "running-in," often with use of abrasives, was method of getting around shortcomings in manufacture. So long as engine revolves freely let it race, he says; if temperature goes up at first, give it several short runs then regard it as run-in.

■ From Sweden comes data on small control bipe designed by Cecil Törner (Sketch A). Powered by 3.5 cc. English diesel, it clips off 60 mph. Fuselage of very smooth lines is truly monocoque, built on form by pasting strips of Kraft paper to thickness of seven layers. Shell is split in half to remove, motor mounts added, then halves rejoined—no internal structure required. Body of this type can be formed even when shape is complex, lends itself to sanding and spray finishing to perfect smoothness, claims Törner.

■ Since 1943, Argentina's "Asosiacion de Aeromodelistas Tuco Tuco" (largest model group in S. America) has grown from eight to 490 members, held its 100th meet recently. Club records listing 410 models lost o.o.s. to date would seem to indicate modeling of high caliber performance or a general disregard of dethermalizers.

■ An Italian, Di Pietro, of Rome, has free flight gassie with vertical vane built above shoulder-mounted wing. McCoy .29 powered, it proved of sound design by placing high in Italian Nats at Bologna. Thus areodynamic, rather than purely structural, aspect of pylon type is acknowledged. Report did not describe flight characteristics, which might have proved very enlightening to rest of us.

■ One of radical German military craft toward end of WW II, the EF-128 swept-wing tailless jet, is reflected in design of large German flying wing glider model seen at recent meet in Berlin (Sketch B). Such interest in fresh design approaches plus capable workmanship



Sketch A

HERE IT IS!

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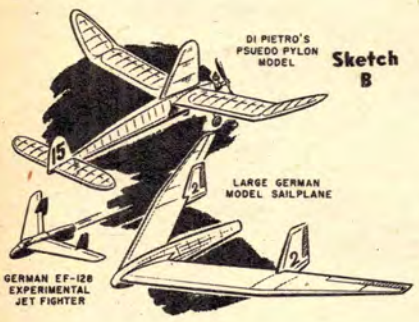
engine a couple of notches. If you have adjusted the model properly, it will glide in an approximate 40-foot diameter circle when the engine cuts.

Carefully observe whether this turn has not caused the glide to become steeper. If this has occurred, increase the wing incidence until the model is on the verge of stalling. If you now run the engine at full power, the model should climb vertically while executing barrel rolls. If it shows any tendency towards looping, correct this by increasing the down thrust of the engine. *Never* use side thrust.

Proper propeller selection is of the utmost importance in free flight models. This choice is even more important for a model climbing in a vertical attitude. Most free flight modelers tend to underestimate the propeller's significance. F/F fans should not be satisfied with the first prop that gives them a reasonably good flight.

Each particular engine requires a propeller of its own. For example, with a hot Wasp engine a seven inch diameter with a three to four pitch should do. On my particular models I obtained the best results with a 7/3 Tornado and fairly good results with 7/4 plastic props. A mathematical check will show that this pitch selection is correct to obtain a 600 foot climb on a 20 second engine run while operating at 10,000 rpm with approximately 60 per cent efficiency.

For the sake of the curious reader interested in the name of this model: "Mambo" is the name of a Latin rhythm comparable to American hot jazz. I originally designed a relatively hot plane and chose to call it "El Mambo" (this model took first place Half-A open at the Tangerine Internationals). Not long ago from "Mambo" evolved a Latin expression of bebop. It was a definite outgrowth of the original rhythm. So was my new model a definite successor to "El Mambo," and I adopted the name of its musical counterpart, "Batiri."



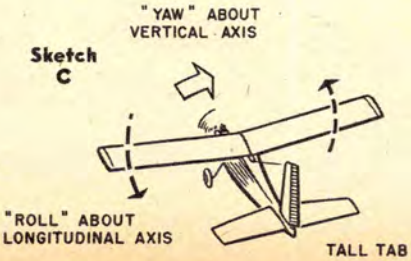
are trend pointing to real achievement in future. Contest activities, under F. A. I. specifications, were extensive with eliminations in ten areas to screen contestants for big meet which embraced whole of West German area.

■ New Zealand, according to *Aeromodeller* magazine report, has surprisingly well-advanced model engine production. More than half the winners in recent National meet were powered by New Zealand-built engines. Team racer record, for instance, was moved up to a respectable 90 mph by Pepperell glow-engine job. Up New Zealand!

■ High costs, the devaluated pound, other difficult conditions affect model merchandising in England and at least one manufacturer, to avoid price increases, has come around to "dry kits" as popularized in America. This firm's ad noted that due to rising costs of raw materials, cement, paste, rubber would be omitted.

■ Howard Boys, British radio control expert, clarifies effect of high rudder tab on controllability (Sketch C.) If tab is tall, above longitudinal centerline of ship, it imparts rolling moment when turned (a tendency to bank model for turn in opposite direction) and also yaws nose for desired turn. Net effect is slow response. Solution is to arrange tab area lower, nearer longitudinal centerline.

—H. A. THOMAS



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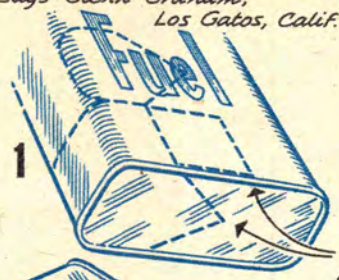
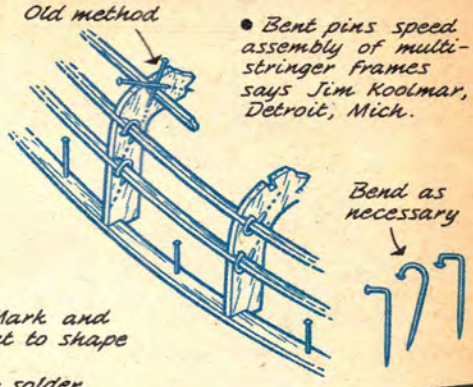
SKETCH BOOK

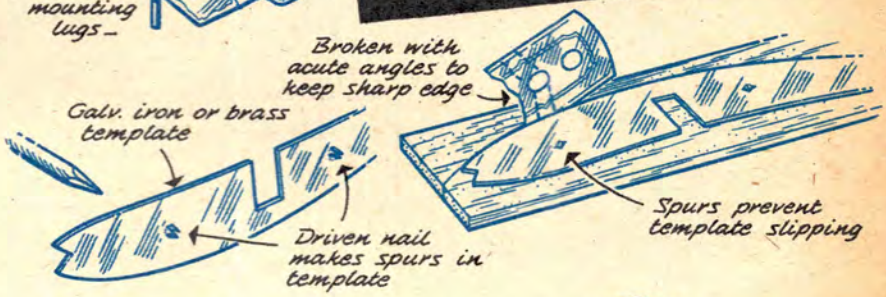
• *Empty fuel cans provide partially-completed fuel tanks says Glenn Graham, Los Gatos, Calif.*



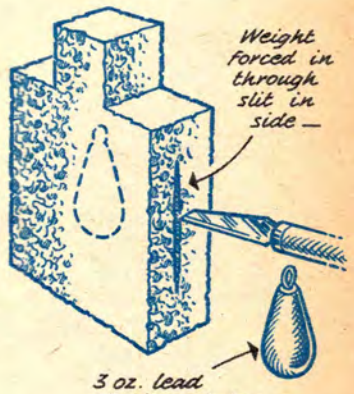
Old method

• *Bent pins speed assembly of multi-stringer frames says Jim Koolmar, Detroit, Mich.*

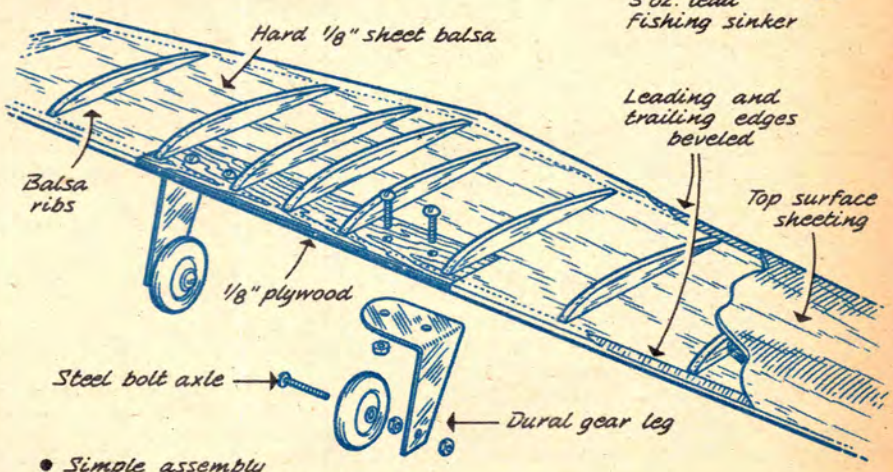



Broken with acute angles to keep sharp edge
Galv. iron or brass template
Driven nail makes spurs in template
Spurs prevent template slipping

• *Japanese modeler Tuneo Kato, Nasugun, Tochigi Pref., submits small refinements which simplify cutting of duplicate sheet parts by templates—*

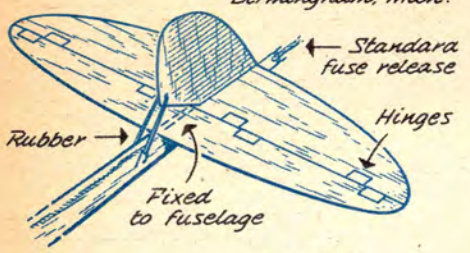


• *Self-shock-absorbing ½A PAA payload dummy cut from DuPont sponge... Can be wedged in place, minimizes crash damage says Fred Verrier, Baltimore, Md.*



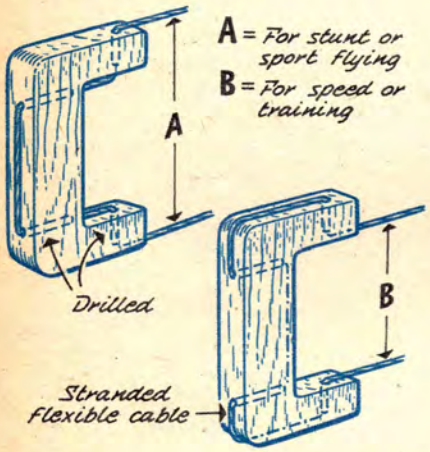
• *Simple assembly of wing and landing gear for scale and team racing models... Submitted by: A. A. Faranda, Yonkers, N. Y.*

• *Pop-up dethermalizer for large hand-launch glider designed by Gerald Messenger, Birmingham, Mich.*

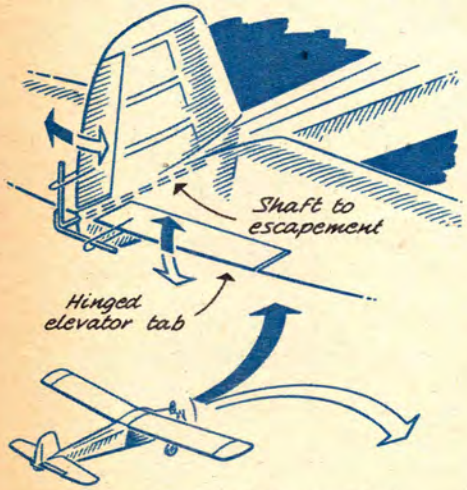


Have you developed something new in construction, control, or flying that might interest other modelers? Send a rough sketch—we'll redraw it and pay $5 for each one accepted. Sorry, we cannot acknowledge or send back submissions.

• *Gary White, Spanish Fork, Utah, uses simple control handle which can have sensitivity quickly adjusted —*



• *Gadget adds elevation control to "rudder-only" radio model, by Chris Williams, Northport, N.Y.*



Left rudder position produces climbing turn . . . right rudder a descending turn —

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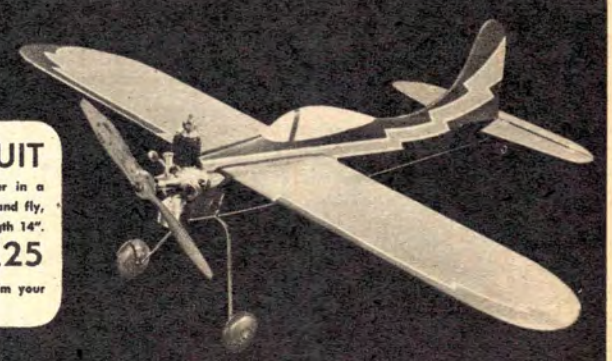

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Western

(Continued from page 58)

burning the oil building lighter frameworks and smooth running props. Maybe next year?

Jack Block built some of those Boston 1/16" sheet wing gliders and walked away with the Indoor Hand Launch, then went to the Outdoor events and won it also. It was about time, for Jack; amazing how he could get so close and still not win with his many fine ships.

Over at the control line events things were certainly buzzing. A late start was due to the lack of pull scales, so Kenny Aymeyer very wisely stated, "No scales, no flying." When the scheduled two o'clock deadline came around, Kenny said, "Let's keep 'em flying"—whereupon a good time was had by all.

Some of the really top stunt men had a little trouble due to gusts and "decked" their ships, among these being Cliff Potts, Dennis Alford and Larry Goodale. Bob Palmer was in front of the pack as usual; just seems that there is no one who can top him.

The speed boys were going hot and heavy mixing fuels, changing props, etc. There were several Torp .19 jobs present, all of them quite fast. In fact, three were within 4 mph of the record. Here again the weather played a sad part, since the fog came up early in the afternoon, causing the outgoing airliners to be out of sight by the time they passed overhead. At times Jim McElroy's D job was a blur on the far side of the circle due to the fog and speed.

Some fellows got up to 27% nitro in their fuels with the engines still running slow. George Mueller from Phoenix flew a new semi-pan Torp .19 job for some really fast time, just missing a new record when he waved in too early. The official times clocked him at 128—after his official run was in on one flight. Jim McElroy, Charley Schuette and Bill Wisnewski all turned in fast times with their respective jobs only after mixing fuels and test-running like mad.

Vic Garner, very proud of his new Class B Proto Speed record, and Jack Friedland were down from Alameda with some fine jobs, finished in their usual clear mahogany and balsa style which is so typical of

Torpedo Joe

By H. SEWARD DION

■ Here is a fast and smooth-flying little job with a purpose. Underneath its fuselage is suspended a torpedo which, after model has been put into flight, can be released along its path against miniature targets.

Fuselage is cut from two pieces of medium hard balsa 26" long. A slot 1/8" wide is cut 3/16" deep at extreme rear of fuselage to permit rudder to be cemented in solidly. The important thing about landing gear is that it must be strong and flexible. The aft wire goes through a reinforcement piece (pine) which is cemented into balsa fuselage profile; the forward wire secured to bottom with aluminum strip, small screws.

From 36" medium hard balsa sheet cut wing in one piece. After shaping, cut wing at center and form root ends for about 2 degrees dihedral. Do not cement wing to the fuselage as satisfactory take-off and landing characteristics can only be ascertained by a forward or rearward adjustment for each flight until model is adjusted for level flying. A rubber strand over top of wing and under fuselage keeps wing in place.

In my own design I cut out small landing flaps to observe landing characteristics and for experimental reasons. The model will fly just as well without this being done, however. You can put from 7 to 9 complete loops of 1/8" flat para rubber.

The torpedo can be made as shown or cut out to suit your fancy. That is, it could be a rocket with different tactical purpose, but try to keep about same scale. The release of torpedo occurs when airplane changes from horizontal flight to slight gliding position.

In order that your torpedo job will perform smoothly, you should fly it in calm weather. Use a propeller bearing well oiled and see that wheels turn easily for self-propelled take-off.

their club's work. Very neat, very fast and flying in the clockwise direction. This seems to be the pattern of the Alameda Aero Modelers which makes them stand out in any contest.

The outdoor free flight events proved a delight, since those fellows who had conducted the previous day's fiasco sure learned in a hurry. Nothing but praise can be said about this day's events. Since the entrants were loaded for bear they seemingly were in for a tough time, but never has a contest been run so smoothly.

It was at these events that an entirely new method of controlling flights made its bow, and a sweet one it was. When a contestant made his entry his flight card was put at the bottom of the pile, names then being called in rotation. When a flight was made it was recorded and the card put back in the stack. This allowed things to progress much more smoothly. This could possibly be due to the fact there are usually quite a few fellows who enter more than one event. By knowing that your card was always in the flight line, you could take flights in one event while awaiting your time in another. The idea will bear watching.

Two of those once-in-a-million rarities took place during this contest, one on Saturday when two towliners kissed wingtips, the other on the next day when Jim Thompson's "Hogan Bel Air," so-called because of the high-visibility windowed cabin, had the misfortune of having a Half-A job hit the wing and slide back to lodge on the rudder. The model spun down from approximately 500 feet only to pull out and make a half safe landing. The flight was a little over five minutes, but Jim elected to take the flight over—the time on this, as one might guess, a minute less, which left him in 6th place.

The proximity of Santa Anita allowed us to take in the regular team race event the same day. Those of you who have never seen one of these events put on by the F.A.S.T. Club are really missing something. Since this one class of models is so much different from others, these fellows seem in a world all their own, and a very nice place it is. Qualifying and beauty judging are accomplished early in the morning, then the boys take time out for a leisurely lunch.

The atmosphere at one of these contests is racing in its purest form. Green flags, yellow flags, red flags, checkered flag and blackboard, all add up to a real sport. When

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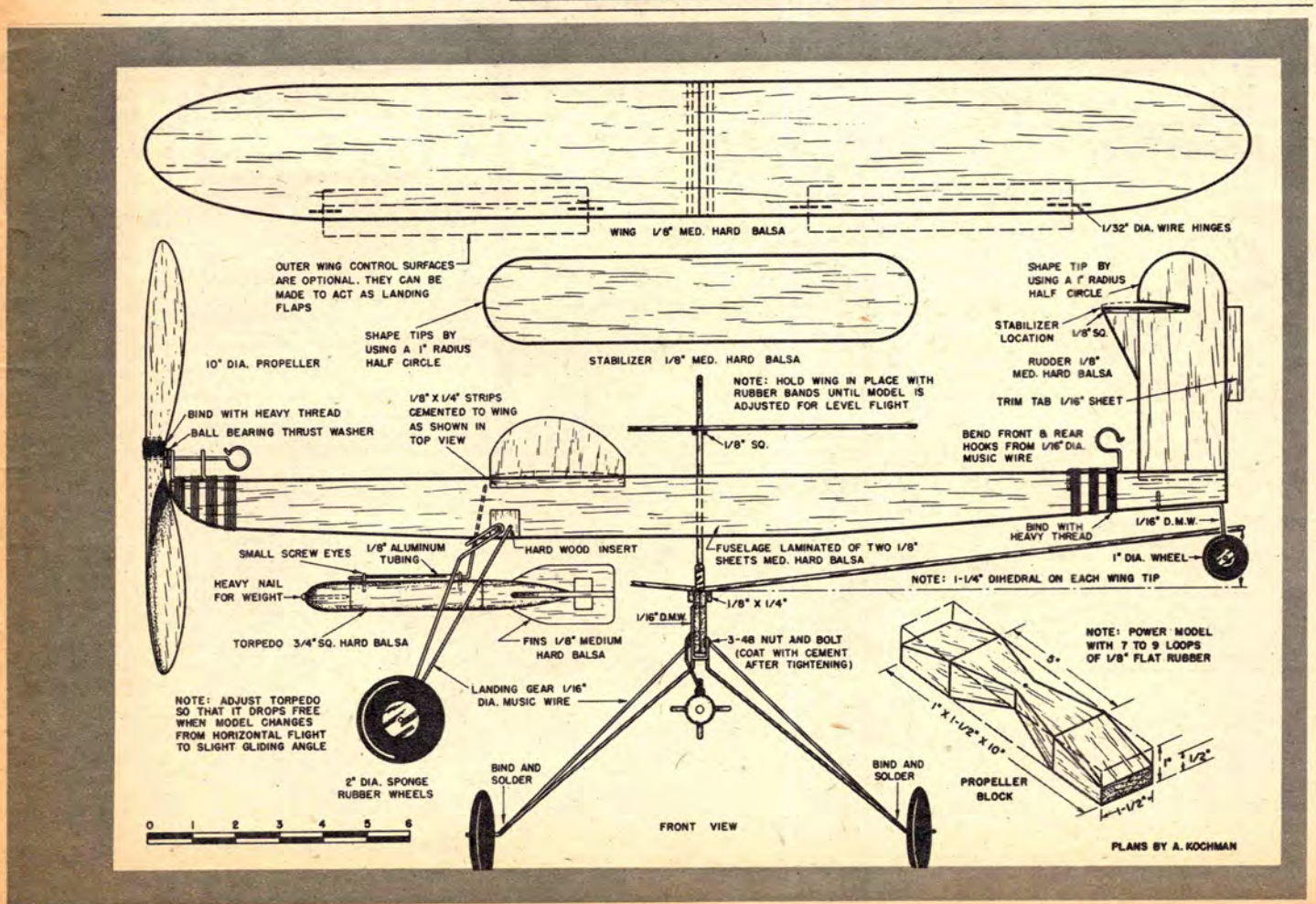
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1/32" DIA. WIRE HINGES
OUTER WING CONTROL SURFACES ARE OPTIONAL. THEY CAN BE MADE TO ACT AS LANDING FLAPS
SHAPE TIPS BY USING A 1" RADIUS HALF CIRCLE
STABILIZER 1/8" MED. HARD BALSA
SHAPE TIP BY USING A 1" RADIUS HALF CIRCLE
STABILIZER LOCATION 1/8" SQ.
RUDDER 1/8" MED. HARD BALSA
TRIM TAB 1/16" SHEET
10" DIA. PROPELLER
BIND WITH HEAVY THREAD
BALL BEARING THRUST WASHER
1/8" X 1/4" STRIPS CEMENTED TO WING AS SHOWN IN TOP VIEW
NOTE: HOLD WING IN PLACE WITH RUBBER BANDS UNTIL MODEL IS ADJUSTED FOR LEVEL FLIGHT
1/8" SQ.
BEND FRONT & REAR HOOKS FROM 1/16" DIA. MUSIC WIRE
BIND WITH HEAVY THREAD
1/16" D.M.W.
1" DIA. WHEEL
SMALL SCREW EYES
1/8" ALUMINUM TUBING
HARD WOOD INSERT
FUSELAGE LAMINATED OF TWO 1/8" SHEETS MED. HARD BALSA
HEAVY NAIL FOR WEIGHT
NOTE: 1-1/4" DIHEDRAL ON EACH WING TIP
1/8" X 1/4"
1/16" D.M.W.
TORPEDO 3/4" SQ. HARD BALSA
FINS 1/8" MEDIUM HARD BALSA
3-48 NUT AND BOLT (COAT WITH CEMENT AFTER TIGHTENING)
NOTE: POWER MODEL WITH 7 TO 9 LOOPS OF 1/8" FLAT RUBBER
LANDING GEAR 1/16" DIA. MUSIC WIRE
NOTE: ADJUST TORPEDO SO THAT IT DROPS FREE WHEN MODEL CHANGES FROM HORIZONTAL FLIGHT TO SLIGHT GLIDING ANGLE
2" DIA. SPONGE RUBBER WHEELS
BIND AND SOLDER
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four models are straining on the stooges and the starter waves the green flag, they are off and flying. A few tense moments are on hand until the first lap is over as the pilots steady down their fast ships, round and round, constantly jockeying for position, a fast climb and dive as one ship passes another. then slightly over a minute later the checkered flag.

Immediately after this race, the P. A. system calls the ships' numbers which are in the next heat. Racing at its very best, full of chills and thrills.

Don Chinn showed his heels to the gang at this meet, easily winning the ten-mile and trophy dash. His time in the trophy dash was 78.99 mph. with his Mac .29, blue and yellow speedster.

Up Northern California way all the guys are wondering what gives or "is it worth it?" Vic Garner had just finished a new Class B Proto Speed job in time to enter it in the Stockton contest. When he tried to enter it he was reminded of the rule which makes colored ships mandatory. No colored dope available. What to do?

Then came the idea. Miss Billie Marie Logan of the Capitol Screamliners supplied the paint—oops—lipstick. The job was colored and how! Vic's ship, with this vivid red paint job, went on to win first and even establish a new record. Now comes the question which surely is in the minds of a lot of fellows: was the ship really hot or was it the lipstick? To paint or not to paint is now the question.

Western Association Modelers sure take this model flying serious. They have a unique event wherein one club can challenge a previous winner in the Robbers Challenge Round to a contest. At this latest meet they located the judges quite some distance apart and each kept his own score. When these score sheets were introduced at a later meeting they were a source of considerable comment.

Variations in scoring between the two judges were quite marked. As a result, it was decided that a school conducted at the flying field where the scoring could be compared would enable the establishment of a standard judging procedure.

So-o-o, they have selected a date and several flyers will be present to go through the pattern or parts thereof. Forms will be on hand so that the judges and students may score and compare, then discuss. They feel that this is certain to bring out many ideas relative to the meanings of the rules as now written, as well as put the finger on those clauses and words which are so confusing. All this promises to bring out a more workable and readable set of rules which will allow each type of flyer an even chance.

Along these lines we can't help but comment on some of the niceties observed while a spectator at some meets. Different fellows seem to be pretty wise to their weak points, so will try and do their bad stunt maneuvers at such an angle to the judges as to look real slick. Overhead eights look good to the judges when done at a 90 degree angle; when one does this it is impossible for the poor fellow to see whether the ship is directly overhead or in front or behind. Some guys do seem to make loops hard and not symmetrical, so if they are performed sideways to the judge they look swell, especially square loops.

We could go on and on, but just offer this as a possible reason why two judges located some 100 feet apart could and probably would in all cases have completely different scores. What say? Maybe judges should be kept well separated; needless to say the scoring might show up who is really good.

The Valley Hawks Annual Contest held at the Sepulveda Basin turned out to be a darn good meet. A little disgruntled were most of the contestants about the limit of two flights, also about the new scoring system which was introduced. As the day progressed and timers proved available most of the time, except for the Half-A event, and as the fellows got a chance to digest the scoring system, attitudes changed till most guys ended up thinking the ideas real good.

The championship points gave six points for each minute, one point for each ten seconds over the minutes, three-quarters of a point for six to nine seconds, one-half a point for four to six seconds and one-quarter a point for up to four seconds. This in itself proved to be a definite turn in events, for by this you got credit for your total flight times and it led to some very close competition. The only place where it hurt was in rubber with its six-minute limit. Nevertheless, one of the rubber placers won the sweepstakes.

Roy Marquardt, whom most old-timers remember for those super beautiful rubber and gas models with sparless wings, made his appearance here which led to quite a bull session over the rubber-powered Wakefields of today. Frank Cummings seems to be a little more than just interested, for he again showed up but did not fly because,

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Ed Slobad turned out to be the big winner due to his first in Half-A PAA load and his other places. The Valley Hawks, as you will remember, had the first Half-A PAA contest in California last year, and have made it an annual event.

Chat with Nat'l Champ

(*Continued from page 25*)

does. We expect to use this basic ship for PAA-Load with a ¼ oz. dummy, for R.O.W., duration, straight line flying contests, balloon busting, etc. Last year we flew a new type of ship after every meeting—took so much time making them, no one had time to do any regular building."

A.T.: "Will the Juniors fly against you older members with these 'standard' ships?"

P.S.: "Yes, but a Junior could easily win when the points are added up for the year. We'll give bonus points for workmanship and original design, besides the points for contest wins and so on; but the Juniors get more points proportionally than the more experienced members. Attendance at meetings also figures in. We will also make indoor planes, and indoor gliders, but the 20 inchers will be the main ships used." (*Ed. Note: Paul is the boy who has to keep track of—and record—all these points!*)

A.T.: "Before we leave, Paul, how about a few highlights of your trip to Miami?"

P.S.: "Well, we flew down, of course. We changed planes at Washington, and while there met Russ Nichols of A.M.A. Then we went on to Miami Beach. We were there about six days. The Exchange Club had set up benches in their convention hall where I built models from kits, along with several members of the Miami Tropic Aeros Club. There were eight of these boys, mostly 14-16 years old, and of course we answered lots of questions on model building, as the Exchange people seemed very interested. We also flew indoor tissue jobs in the hall. We sure kept busy—used up about $150 worth of kits and supplies (provided by the Exchange Clubs!). There were also sightseeing tours, and a dinner where I was presented with this engraved Gallet Chronograph I'm wearing. Now I'm here in New York to appear on a TV show and I'll leave for home late tonight. What a trip!"

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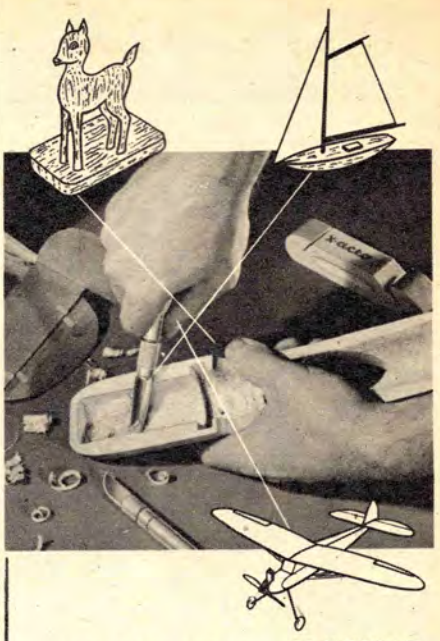

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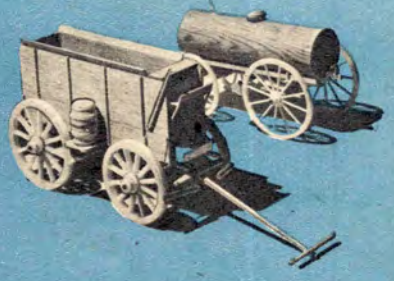

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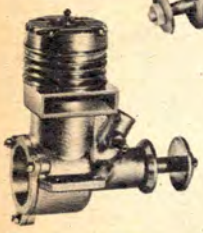

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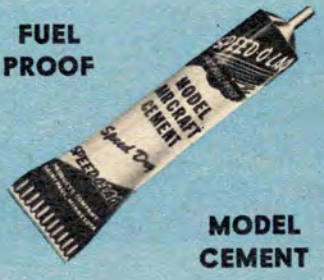

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Dope Can

(*Continued from page 54*)

aerobatic stunt; C-D aerobatic stunt. Special events—Radio Control, PAA-Load, Clipper Cargo and Beauty.

Apparently the model members of the AF will not be lacking in activity this coming season. The "finals" will be preceded by Air Training Command championships and prior to that individual bases will run off contests to determine who will go on to the intermediate competition. And everybody gets to travel by air—too!

Advance Note. We love it when people tell us of meets far enough in advance so you folks can prepare properly. Ken Held and Warren Bartlett, A.M.A. and Plymouth wheels respectively, inform us that the Michigan State Meet will be run off next June 28 and 29. Now don't say you didn't hear about *that* contest early enough!

Speaking of Michigan reminds us to inform you of the results of record trials held under the rules of the Code Sportif, Federation Aeronautique Internationale. These trials were sponsored by the Michigan Modelers Association. Anyone familiar with the F.A.I. rules under which international records are set will tell you that they impose quite a load on the officials. You really gotta be good to conduct record attempts under the Federation's regulations. Officials in attendance at this particular event were Joseph "Tiny" Stefani and James Graves of the Windsor, Ont., M.A.C., Walter Stevenson, Richard Conrady and Warren Bartlett, Strathmoor (Detroit) MC, Edward Stoll, Detroit Balsa Bugs and Joseph Dellaire, Detroit Sky Guys.

Heavy rains and continually threatening weather limited the turnout of contestants. However, attempts were made in Orthodox Speed, Categories II and III and Flying Wing Speed, Category II and Jet. Record dossiers are being prepared for a jet flying wing flight of 119.5507 miles per hour by Bill Doonan, Ann Arbor Airfoilers, and a Category II flying wing flight of 96.3620 miles per hour by Dick Sprague, Strathmoor Model Club. Sprague's flight exceeds the Russian-held mark by better than 35 miles per hour. Doonan's flight established the first record for jet wings, and fell just 8 mph short of the world jet class record now held by Tom Baker. If accepted these will bring to four the total number of F.A.I. records held by the United States.

So much favorable comment has been made about the trials that the subject of a spring record trials will be discussed at future meetings of the Association.

Dopey Dopester. "Sometimes," observes George DeLaMater of St. Johns, Mo., "I wonder if I am getting so old that my mind is beginning to slip, for more and more of the things that I read don't seem to make sense to me. I refer to the 'Dopester's' brainstorm concerning the 'builder of the model' rule. Were the original founders of A.M.A. so stupid as the DOPEster tries to make out?

"As for the first objection to the rule, namely that it can't be enforced, one might as well argue that we shouldn't have laws against murder or drunken driving, since somebody will do these things anyway. The real question is, 'Does the rule serve a good purpose?' (as a great many people still seem to think it does), not 'How many cheats and poor sports are successful in evading it?'

"Let me say that I feel that meets should be won by the best builders flying the most carefully designed models in the most efficient manner. Model aviation should stimulate and encourage patience, careful craftsmanship, attention to details, knowledge of aerodynamic fundamentals, and the ability to conceive and execute new ideas. How one intends to further such objectives by encouraging elaborate prefabrication and most recently the borrowing of another's airplane for a contest is beyond me. Perhaps the Dopester has a different set of objectives than the above. If so, let him state what the objectives and purposes of model aviation really are. Maybe I'm all wet.

"If we do away with the builder of the

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model rule we might face such situations as these:

"Mr. X likes A/2 gas models, so he builds several and has them all flown by his friends in the local contests. They *are* good ships and usually take several top plaees. Result: one man hogs all the prizes.

"A club decides that it would be fine if one of its members won the national championship. John A. concentrates on a pair of hot rubber jobs. Tom B. and Jim C. spend all year turning out a quartet of gas models. The clubs speed merchants, Jack D. and Doug E., soup up their hottest planes. The indoor specialist, Pete F., develops a pair of top-notch microfilms and the rest of the gang pitches in with gliders, flying scales, etc. The scene shifts to the Nationals where all of these excellent models are entered under the name of *one* contestant, chosen by lot. He is given help and advice by the specialists who built the models. Result: He wins the championship, leaving the one-man flyers far behind.

"Finally consider the case of the 13-year-old who has worked hard to put together his model. He brings it to a contest only to be beaten by another 13-year-old flying a model built by his father, who has 20 years of contest experience. Is the first lad going to be encouraged to keep up modeling?

"The story of the chap who had some good models but couldn't get to the contest to fly them does present a problem. One solution would be to liberalize the rules pertaining to proxy flying. Let the models be flown by the fellow who could make it, but in the name of the builder. To prevent abuse of such a rule a contestant should be limited to one proxy flyer per contest. Otherwise, he will be flying in a dozen events simultaneously (by proxy, of course).

"I do not feel that the only answer to long processing lines is the abolishment of all rules. Our club has put on over half of the invitational meets in the St. Louis area in the last two years and we have never had trouble with long lines. The secret is to spend a few hours *before* the contest planning a Flow-sheet of the processing, registration and recording set-up. Then at the meet we draft, for a couple of hours only, the club members most adept with a tape measure and slide rule to take care of the first rush.

"Of course, all model builders put off flying until the last minute and then complain because there are too few timers and the contest is not extended beyond the announced closing time. This happened at the last meet, but the loudest gripers forgot that during the first hour only two people asked for official flights. Human nature, I guess."

The Other Viewpoint. "Having just completed reading the Dope Can, I am pleased to see that there are many good ideas for rule variations." This somewhat differing opinion comes from Bob Buragas, Arlington, N. J. "Adding the 'close to the bone' sequence on 'is Jerry a good sport or a cheat?' made this article the most down to earth item that I have had the pleasure to read.

"My contention is still that the major basis of trouble with rules is the model builder. Cynical? I don't think so. Many

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good suggestions for rules and rule changes are accepted and then warped beyond recognition in actual use. And, I still contend that the trend is to see how successfully the rules can be by-passed in an effort to obtain a decisive edge over the rest of the modelers in competition.

"Take the weight rule as an example. Years ago, it was not uncommon to find many using lead-loaded pencells to weigh in their models and then switch to legitimate batteries under the pretext that the phony pair had burned out. This practice should have gone out with ignition. This summer, as a contestant, I saw a glow ship using penlites as alleged heater batteries on a big 'Cyke' job. A feasible method. The only catch is the fact that the timer, unaware of the conditions, was not able to notice that flights were made less batteries. These batteries were lead-loaded and were used for the sole purpose of weighing in.

"In PAA-Load it is not uncommon to see contestants use one dummy to weigh in and another to fly. Why the change? Simply a difference in weight!

"Oh, the process goes on and on. Towliners have hidden ballast compartments, rubber models are weighed in with oversize motors that are later switched for the proper power and the crowning glory is the process of switching to larger engine displacements when no one is looking.

"Then there is a rule that states, only one model may be entered in an event. Ha, Ha. Who ever heard of that one being enforced?

"I was forced to disqualify a flight this past season because a modeler was using his own timer. The decision was in the interest of the contestants as a whole. What was the response? The action story resolved around, 'I didn't know.' The model builder in question was a 'twenty year' modeler and he didn't know! Who does know?

"Frankly, I have often been tempted to write an article called, 'So you want to cheat the judges?' But many beginners might accept this material for their own usage rather than a means of uncovering modelers who crib. It is better unwritten.

"The contest directors, the judges, and the timers are supposed to enforce the rules at any meet. To date, the catch is that these very officials are not familiar with the rules. Two flagrant examples of misuse are the R.O.G. rule and the Delayed Flight rule. Many builders feel that R.O.G. flight starts when the wheels leave the ground and that timing begins at this time, also. There is also a feeling that a delayed flight can be called at any time before the model is in the air for forty seconds, regardless of the final flight duration. The result has been the fact that many modelers call a delay when the motor run is shorter than the time allowed or the flight is not following the pattern that they would prefer.

"I have seen officials time towline gliders from the instant the craft left the launcher's hand instead of from the time that the line was dropped. When informed of this fault they proceeded to time rubber models from the time that the prop folded. Their crowning glory was when they stopped timing gas models when the dethermalizer popped up!

"What can be done to prevent this? So far, nothing! Report a violation of the rules to a CD and you will soon find that he has a reluctance toward doing anything about it. Add a little pressure and he might disqualify a flight.

"A true example and outcome ran this way. A contestant was flying U-control in four events and was caught using tapered lines; a violation of the wire diameter rule and a very unsafe way of flying. He was disqualified from the event in which he used the tapered lines. By inference he had also used tapered lines in the other events but was not caught. He was allowed to retain his standing in the other three events. Actually, the violation of safety practices jeopardized the spectators, contestants and the sport and was sufficient to bar him from the contest for unsportsmanlike conduct. Who will take such a step?

"Rules are like laws: without teeth they resemble the English bulldog gumming his bone! And that is just what is happening: we are gumming away.

"There is a practical problem of rules enforcement which is always bypassed, or subordinated, when rules discussions come up. The prime consideration should be the enforcement of the rules as they are accepted for use and not as they are interpreted by the model 'legal beagles.'

"Secondary is a set of rules that is written in plain, ordinary and decisive English. Rules that are written with the idea that cribbing will exist and can only be effectively prevented if the rules are simple enough to understand.

"The worst offenders are the leading model builders that crib because they get away with it. If caught, and they have on occasion been caught, they fly in what is known as the 'underground' process. They build the models and have them 'proxy' flown at contests. Word is circulated that

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"If names, dates, and offenses were necessary, there is a long list to draw from. But, the trouble is not with the cribbers. It is with those who allow them to get away with it—the officials that do not have the gumption to take the necessary steps."

Club Chatter. Governing body for model aeronautics in New South Wales under sanction from the Model Aeronautical Association of Australia (all of this reaches back somehow to Paris and the F.A.I.) is—as you might have guessed—the Model Aeronautical Association of N.S.W. Mr. L. Street is the publicity director and reading between the lines of his letter apparently some other bloke or group is trying to cut in on the publicity of the All-Australian Nationals. Anyhoo, if you want to contact the official organization down there write L. Street at 15 Riverside Crescent, Marrickville.

A model hobby club has been set up at the R.C.A.F. Station at Gimli, Man., Canada. Sgt. A. Westwell is the secretary-treasurer and says the group could use any plans, wall pictures of planes or similar items anyone may care to send. How about it, Canadian clubs?

Dallas-Ft. Worth: "We have started a series of contests here for control line models that will be held on the first Sunday of each month alternating between Dallas and Ft. Worth," reports Maurice ('51 Nats Director) Teter. "The free flight clubs are having joint contests each month also. The Park Departments of both cities are very interested and are certainly cooperating 100 per cent. I think this will go a long way to improve both the interest and the quality of model aviation here." Local modelers who are interested can contact Mr. Teter at 2025 Abrams Road, Dallas, for additional dope.

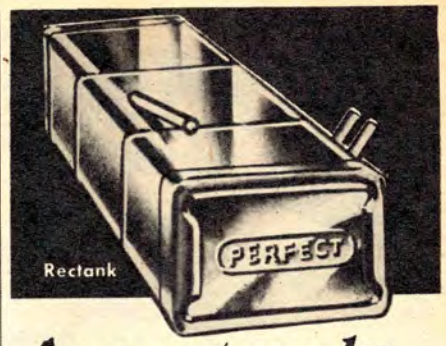
You think Canada is slow in modeling? Listen to this: "We all hope to go to the Maritime 'Nationals' which will be held at Shearwater Naval Base, Nova Scotia. This meet is held on the same principle as the Nationals at Dallas. There will be an air-show with Navy planes and helicopters, free rooms, the meals at a nominal cost and there will be a victory banquet and prizes presented."

That's John Forbes speaking. He is president of the P.A.L. Club in Fredericton, N.B., Canada. The outfit is now sponsored by the local Plymouth dealer, McEwan Motors; it's thought to be the first such club in the Maritimes. The sixteen members average 16 years of age. The club meets on Thursday evenings. John's address is 508 Charlotte St.

Attention, you 16-year-old English enthusiasts. Bob Reynolds, 503 Emerson, Detroit 15, Mich., would like to write regularly. Tally-ho!

Fifteen-year-old model enthusiast in Siam wants to correspond with Americans: Santi Vibul, 63/2 Ruam Rudi Lane, Pleon Chit Road, Bangkok, Thailand.

The model for this year's March of Dimes poster is one of the AF's own. Little Larry Jim Gross is the son of CWO Jim Gross, attached to the U. S. Air Force Weather Group in Wiesbaden, Germany. Stricken early by polio and on crutches for five years, Larry Jim can now, thanks to March of Dime funds, run, climb trees and play cowboy with his friends.



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7	2/3	1"	1-1/2"	1-1/4"	up to .23	49c
8	1-1/4	1"	1-1/2"	2"	up to .35	49c
9	2	1"	1-1/2"	3"	up to .39	59c
10	2-1/3	1-1/8"	2-1/4"	2"	up to .51	59c
11	4	1-1/8"	2-1/4"	3-1/2"	up to .65	69c
12	2-1/2	1-1/4"	1-5/8"	2"	up to .51	59c
13	3-3/4	1-1/4"	1-5/8"	3"	up to .65	69c
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*Tests of all models were made by expert flyers, with instructions to obtain maximum performance from each model. Flyers were permitted to use U.S. T-56 rubber for any model where inferior rubber was included in the kit.

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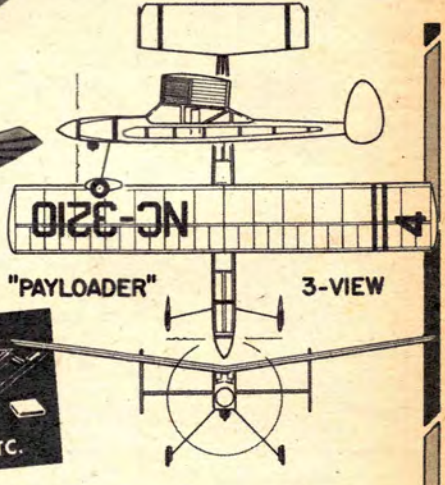

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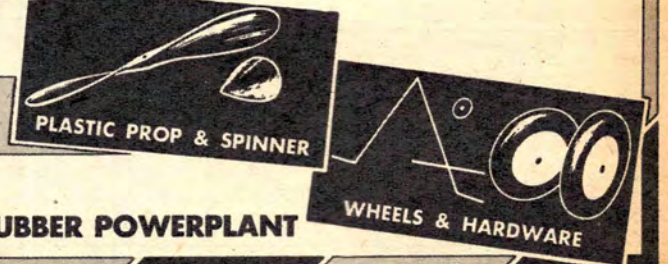

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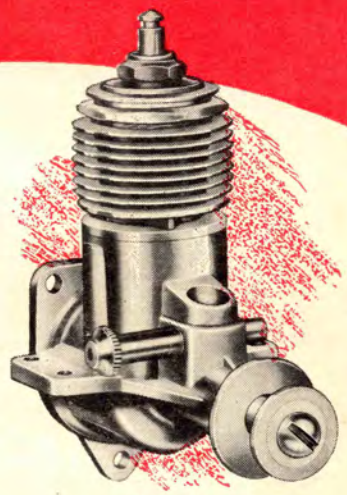

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